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2016 年港灣環境資訊網觀測資料年報
(中雲海域觀測海氣象資料)

交通部運輸研究所

中華民國 106 年 9 月

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著者：蘇青和、李俊穎、陳明宗、劉清松
傅怡釧、陳鈞彥、林珂如、謝佳紘

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<tr><td colspan="4">摘要：
本港灣環境資訊網觀測海氣象資料年報，包括中雲海域2016年觀測風力、波浪、潮汐及海流等資料之觀測記錄表及逐時資料歷線圖。</td></tr>
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This Annual report 2016 of Harbor Environment Information Website(HEIV) covers the observation data of winds, waves, tides and currents near Chung-Yun offshoe region in Taiwan. The contents in this Annual report include the records of observation and the time series of data.</td></tr>
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目　錄

中文摘要..... Ⅰ

英文摘要..... Ⅱ

目錄..... Ⅲ

誌謝..... Ⅴ

第一章 2016 年中雲海域觀測風力資料 **1-1**

第二章 2016 年中雲海域觀測波浪資料 **2-1**

第三章 2016 年中雲海域觀測潮汐資料 **3-1**

第四章 2016 年中雲海域觀測海流資料 **4-1**

誌　　謝

2016 年港灣環境資訊網觀測風力資料，蒐集之中雲海域風力資料，除本中心自行觀測之外，在梧棲氣象站(**測站 E**) 觀測風力資料，係交通部**中央氣象局(CWB)**提供。麥寮氣象站**(測站 H**、**測站 I)**觀測風力資料，係經濟部**水利署(WRA)**提供。彰濱外海浮標站(**測站 Y)**風力資料，係**海科中心**(TORI)所設置；彰濱外海一浮標站(**測站 Z**)及彰濱外海二浮標站(**測站 R**)之風速儀屬中興工程所設置，謹致謝忱。

2016 年港灣環境資訊網觀測波浪資料，蒐集之中雲海域波浪資料，除本中心自行觀測之外，在彰濱外海浮標站(**測站 Y)**波浪儀，係**海科中心**(TORI)所設置；彰濱外海一浮標站(**測站 Z**)及彰濱外海二浮標站(**測站 R**)之波浪儀屬中興工程所設置，謹致謝忱。

2016 年港灣海氣象觀測潮汐資料，蒐集之中雲海域潮汐觀測資料，除本中心自行觀測之外，在麥寮(**測站 J**)、芳苑(**測站 K**)等觀測潮汐資料，係經濟部**水利署**提供，謹致謝忱。

2016 年港灣環境資訊網觀測海流資料，蒐集之中雲海域海流資料，除本中心自行觀測之外，在彰濱外海浮標站(**測站 Y)** 海流儀，係**海科中心**(TORI)所設置，謹致謝忱。

第一章　2016 年中雲海域觀測風力資料

中雲海域(臺中~雲林)風之觀測係 2001 年 6 月，本中心**(IHMT)**於台中港北防風林處(**測站 B**)安裝 Young Brand 風速計，儀器高度約 10m，2009 年 9 月更新為 Gill 二維超音波式風速計，另於 2005 年 9 月在臺中港北防波堤白燈塔頂安裝風速儀(**測站 W**)，2009 年 9 月更新為 Gill 二維超音波式風速計，其位置如附圖 1。。

測站 E 之風速儀屬中央氣象局**(CWB)**所有。麥寮氣象站**測站 H 及測站 I** 之風速儀則屬水利署所有，**測站 Y**(彰濱外海浮標站)之風速儀屬海科中心**(TORI)**所設置，**測站 Z**(彰濱外海一浮標站)及**測站 R**(彰濱外海二浮標站)之風速儀屬中興工程所設置。各測站歷年觀測風資料蒐集概況如表 1。

本中心測站風資料之蒐集係採取每小時測定十分鐘之風速、風向數據加以平均，而得出該小時之平均風速、平均風向、最大陣風風速、最大陣風風向、最大陣風之發生時間。本中心之風力資料以取平均風速及平均風向為主。其他測站觀測資料也是平均風速(m/s)及風向(度)。

本風力年報以取經檢核或修補後之 **W 站**資料作為**主要觀測站**，2016 年主要觀測站修補前(後)每月觀測之風資料記錄期間統計表，如表 1.1a，2016 年風力**次要觀測站**資料(未補餘)記錄統計表，如表 1.1b，**主要觀測站修補前後**每月風力歷線比較圖，如圖 1.1，**主要觀測站**與**次要觀測站**(或**其他觀測站**)每月風力歷線比較圖，如圖 1.2 以後。

表 1 中雲海域觀測風力資料蒐集概況表(統計時間至 2016 年 11 月)

測站	緯度	經度	觀測期間	觀測單位	備註
B	24°18'18"N	120°31'52"E	2001/07-2016/11(觀測中)	港研中心	台中港北防風林
W	24°17'59"N	120°29'12"E	1996/09-1997/11 2005/09-2016/11(觀測中)	港研中心	台中港北堤燈塔
E	24°15'25"N	120°31'23"E	1996/09-2016/11(觀測中)	中央氣象局	梧棲站
Y	24°01'12"N	120°13'59"E	2006/08-2016/11(觀測中)	海科中心	彰濱浮標站
H	24°47'9"N	120°9'39"E	2000/01-2009/06	水利署	麥寮氣象站
I	24°47'9"N	120°9'39"E	2006/09-2016/11(觀測中)	水利署	麥寮氣象站
Z	24°06'24"	119°41'33"	2006/09-2016/11(觀測中)	中興工程	彰化外海一浮標
R	24°06'56"	119°51'08"	2006/09-2016/11(觀測中)	中興工程	彰化外海二浮標

圖 1 中雲海域風力觀測站位置示意圖

表1.1a 2016年每月中雲海域修補前各測站觀測風力資料紀錄統計表

年/月 港區	中雲海域	中雲海域	中雲海域	中雲海域	中雲海域	中雲海域	中雲海域	中雲海域
測站	W	Y	B	E	H	I	R	Z
2015/12月	744 (100%)	580 (78.0%)	*	744 (100%)	*	744 (100%)	*	*
2016/ 1月	744 (100%)	317 (42.6%)	*	743 (99.9%)	*	741 (99.6%)	*	*
2016/ 2月	696 (100%)	*	*	696 (100%)	*	695 (99.9%)	*	*
2016/ 3月	744 (100%)	347 (46.6%)	729 (98.0%)	744 (100%)	*	742 (99.7%)	*	*
2016/ 4月	720 (100%)	715 (99.3%)	720 (100%)	720 (100%)	*	719 (99.9%)	*	*
2016/ 5月	744 (100%)	741 (99.6%)	743 (99.9%)	744 (100%)	*	743 (99.9%)	*	*
2016/ 6月	720 (100%)	617 (85.7%)	720 (100%)	720 (100%)	*	718 (99.7%)	*	*
2016/ 7月	744 (100%)	716 (96.2%)	613 (82.4%)	744 (100%)	*	744 (100%)	*	*
2016/ 8月	744 (100%)	740 (99.5%)	744 (100%)	744 (100%)	*	743 (99.9%)	*	*
2016/ 9月	720 (100%)	707 (98.2%)	676 (93.9%)	720 (100%)	*	720 (100%)	488 (67.8%)	493 (68.5%)
2016/10月	744 (100%)	681 (91.5%)	744 (100%)	744 (100%)	*	741 (99.6%)	669 (89.9%)	667 (89.7%)
2016/11月	720 (100%)	619 (86.0%)	719 (99.9%)	720 (100%)	*	720 (100%)	615 (85.4%)	622 (86.4%)
2016/冬季	*	*	*	*	*	*	*	*
2016/春季	*	*	*	*	*	*	*	*
2016/夏季	*	*	*	*	*	*	*	*
2016/秋季	*	*	*	*	*	*	*	*
2016/整年	*	*	*	*	*	*	*	*
起始年月	*	*	*	*	*	*	*	*
結束年月	*	*	*	*	*	*	*	*

表1.1b 2016年每月中雲海域修補後各測站風力資料統計表

年/月 港區	中雲海域	中雲海域	中雲海域	中雲海域	中雲海域	中雲海域	中雲海域	中雲海域
測站	W	Y	B	E	H	I	R	Z
2015/12月	744 (100%)	*	*	*	*	*	*	*
2016/ 1月	744 (100%)	*	*	*	*	*	*	*
2016/ 2月	696 (100%)	*	*	*	*	*	*	*
2016/ 3月	744 (100%)	*	*	*	*	*	*	*
2016/ 4月	720 (100%)	*	*	*	*	*	*	*
2016/ 5月	744 (100%)	*	*	*	*	*	*	*
2016/ 6月	720 (100%)	*	*	*	*	*	*	*
2016/ 7月	744 (100%)	*	*	*	*	*	*	*
2016/ 8月	744 (100%)	*	*	*	*	*	*	*
2016/ 9月	720 (100%)	*	*	*	*	*	*	*
2016/10月	744 (100%)	*	*	*	*	*	*	*
2016/11月	720 (100%)	*	*	*	*	*	*	*
2016/冬季	*	*	*	*	*	*	*	*
2016/春季	*	*	*	*	*	*	*	*
2016/夏季	*	*	*	*	*	*	*	*
2016/秋季	*	*	*	*	*	*	*	*
2016/整年	*	*	*	*	*	*	*	*
起始年月	*	*	*	*	*	*	*	*
結束年月	*	*	*	*	*	*	*	*

Wind Speed in Chung-Yun Seas of TCW0 at 2016

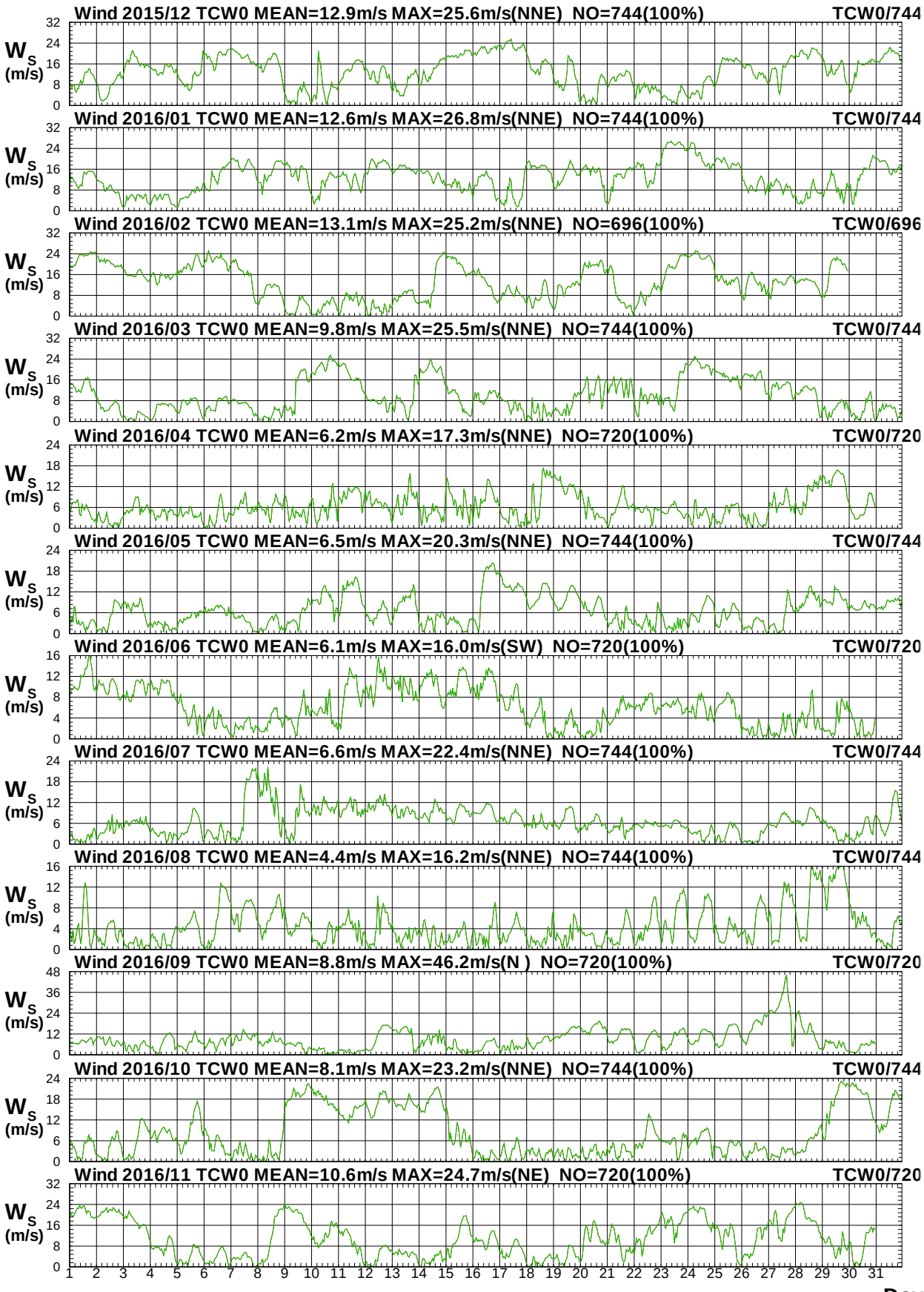

圖1.1a　2016年每月中雲海域 W 站修補前後之風速比較圖

W15CTCW0.1HA W15CTCW0.1H0 W161TCW0.1HA W161TCW0.1H0 W162TCW0.1HA W162TCW0.1H0
W163TCW0.1HA W163TCW0.1H0 W164TCW0.1HA W164TCW0.1H0 W165TCW0.1HA W165TCW0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

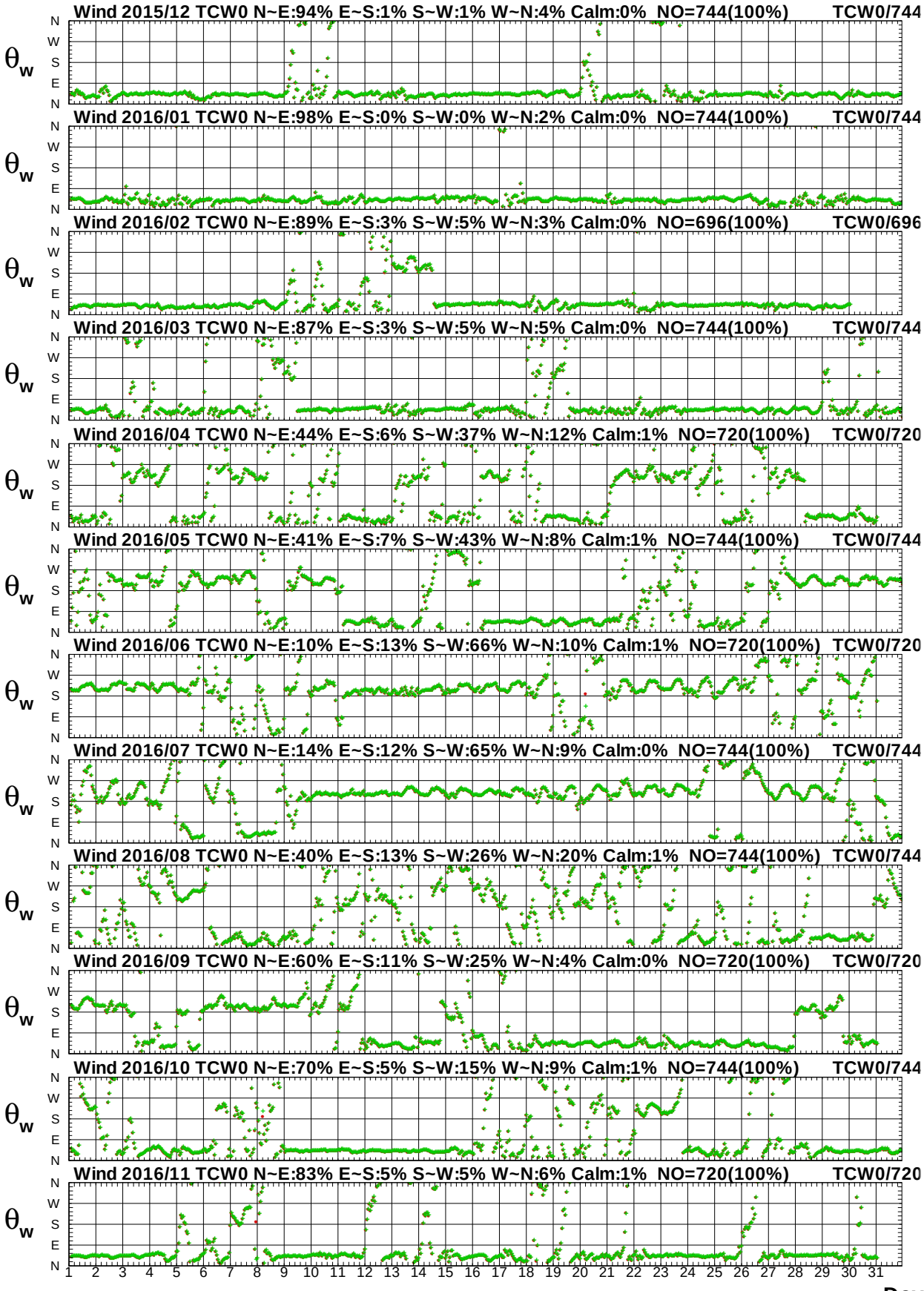

圖 1.1b　2016年每月中雲海域 W 站修補前後之風向比較圖

Wind Speed in Chung-Yun Seas of TCW0 at 2016

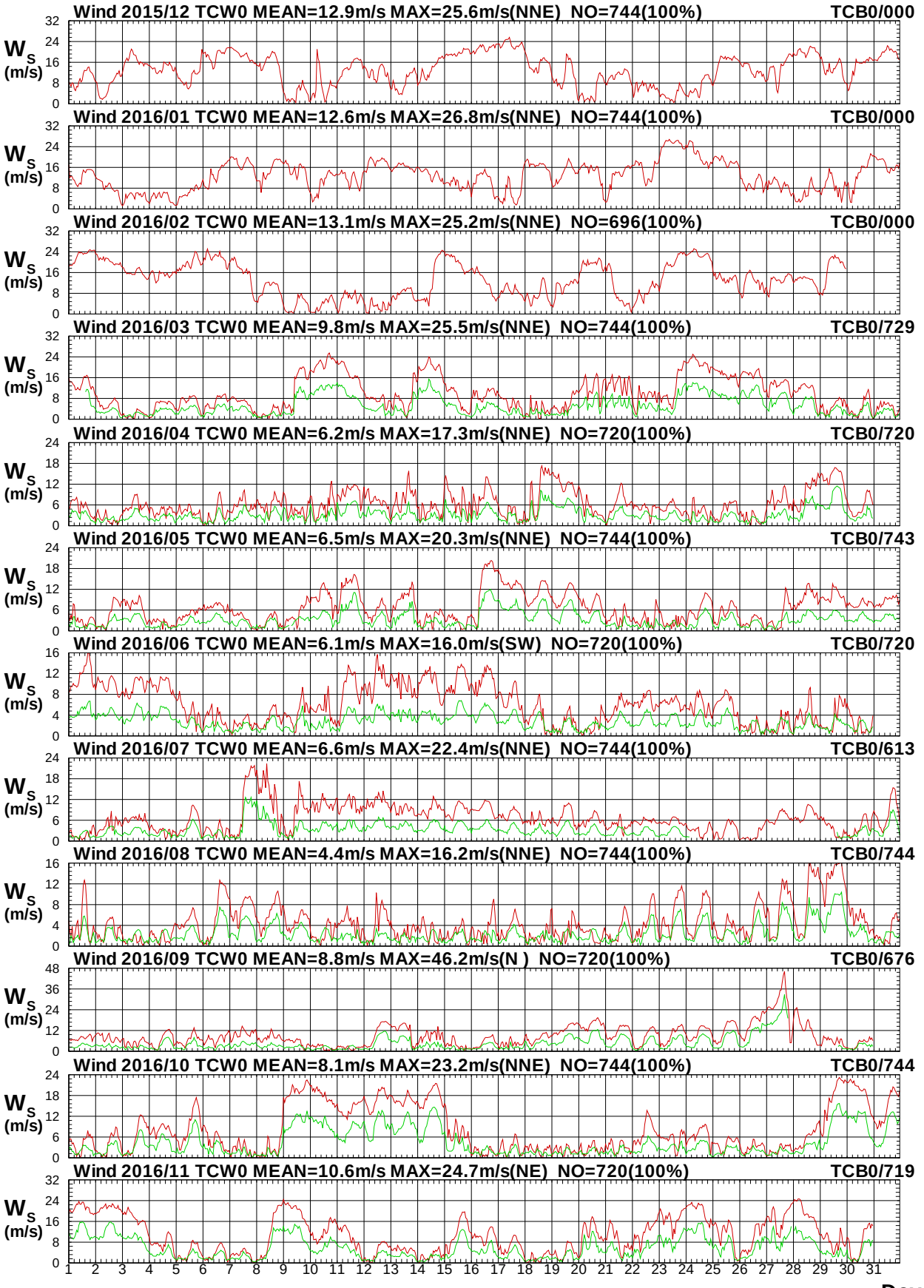

圖1.2a　2016年每月中雲海域 W 站與 B 站風速比較圖

W15CTCW0.1HA W15CTCB0.1H0 W161TCW0.1HA W161TCB0.1H0 W162TCW0.1HA W162TCB0.1H0
W163TCW0.1HA W163TCB0.1H0 W164TCW0.1HA W164TCB0.1H0 W165TCW0.1HA W165TCB0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

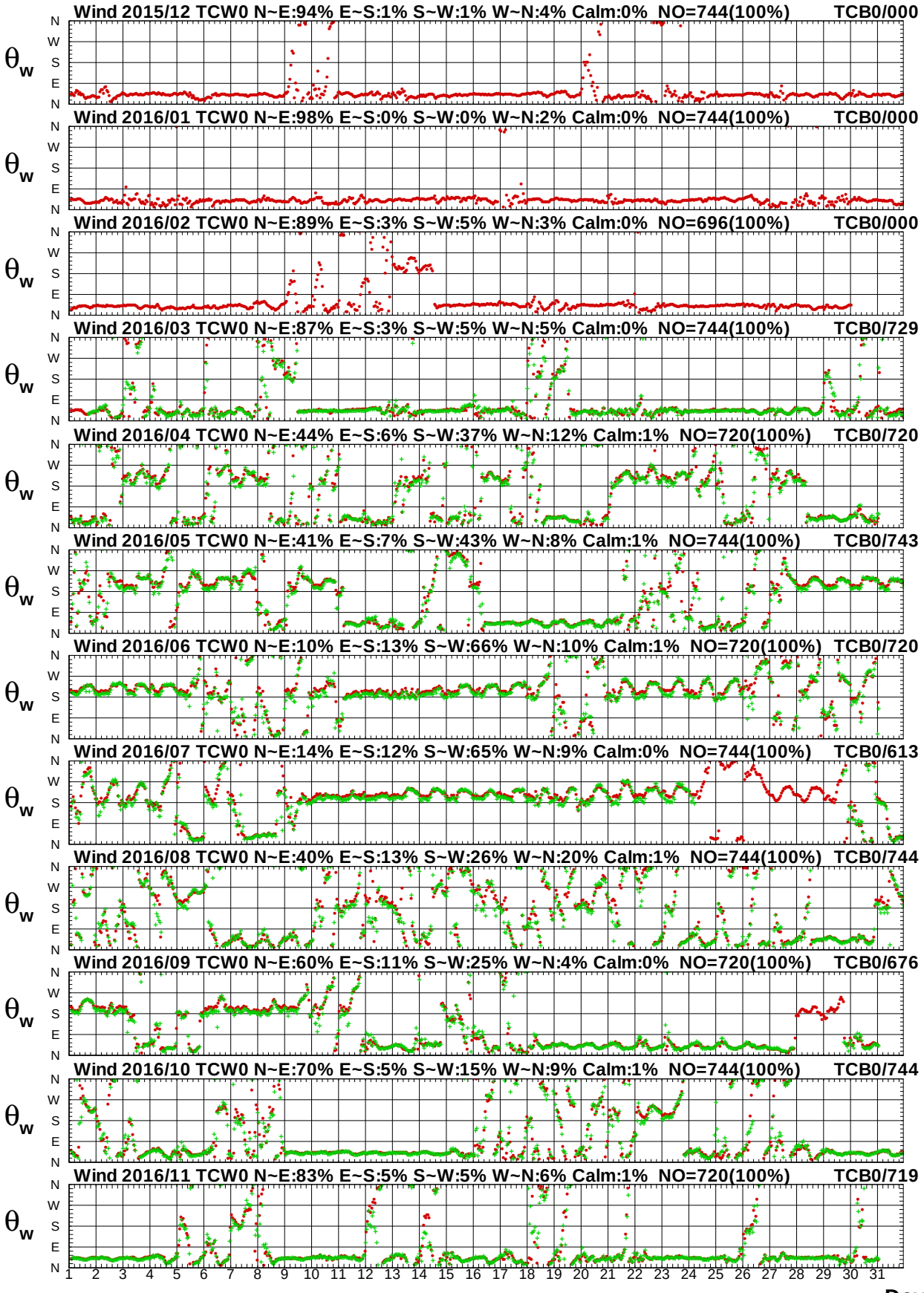

圖 1.2b　2016年每月中雲海域 W 站與 B 站風向比較圖

Wind Speed in Chung-Yun Seas of TCW0 at 2016

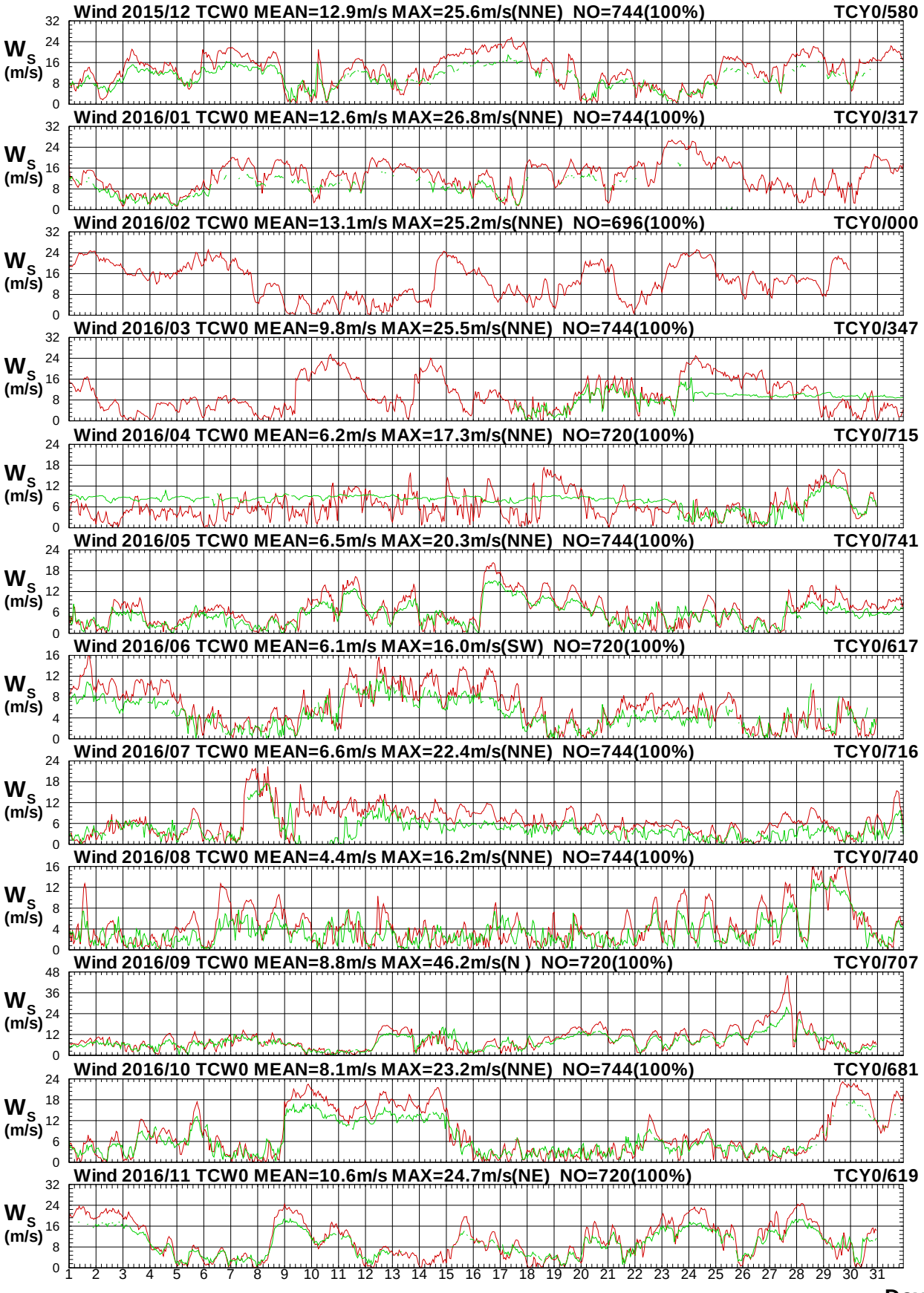

圖 1.3a　2016年每月中雲海域 W 站與 Y 站風速比較圖

W15CTCW0.1HA W15CTCY0.1H0 W161TCW0.1HA W161TCY0.1H0 W162TCW0.1HA W162TCY0.1H0
W163TCW0.1HA W163TCY0.1H0 W164TCW0.1HA W164TCY0.1H0 W165TCW0.1HA W165TCY0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

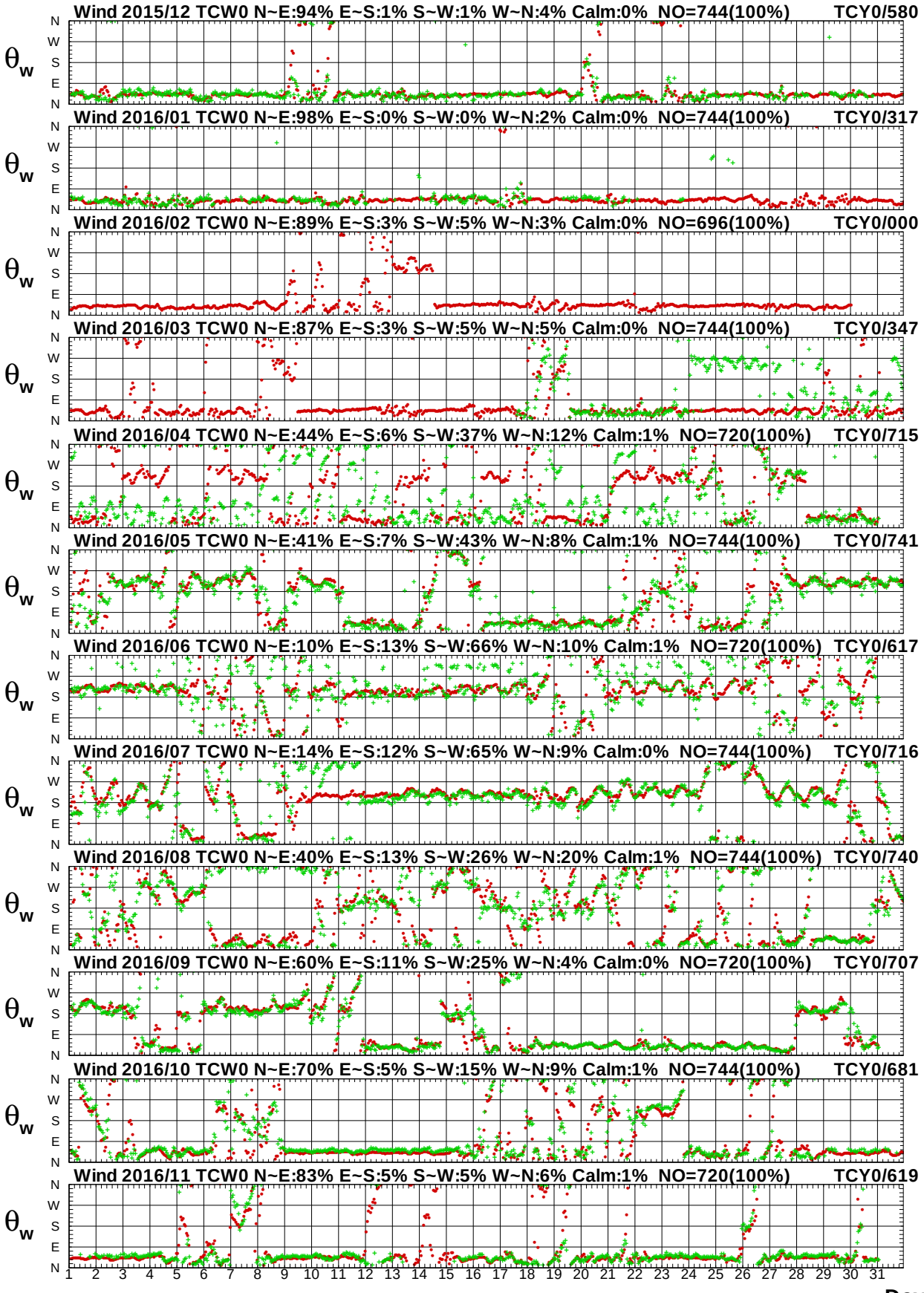

圖 1.3b　2016年每月中雲海域 W 站與 Y 站風向比較圖

Wind Speed in Chung-Yun Seas of TCW0 at 2016

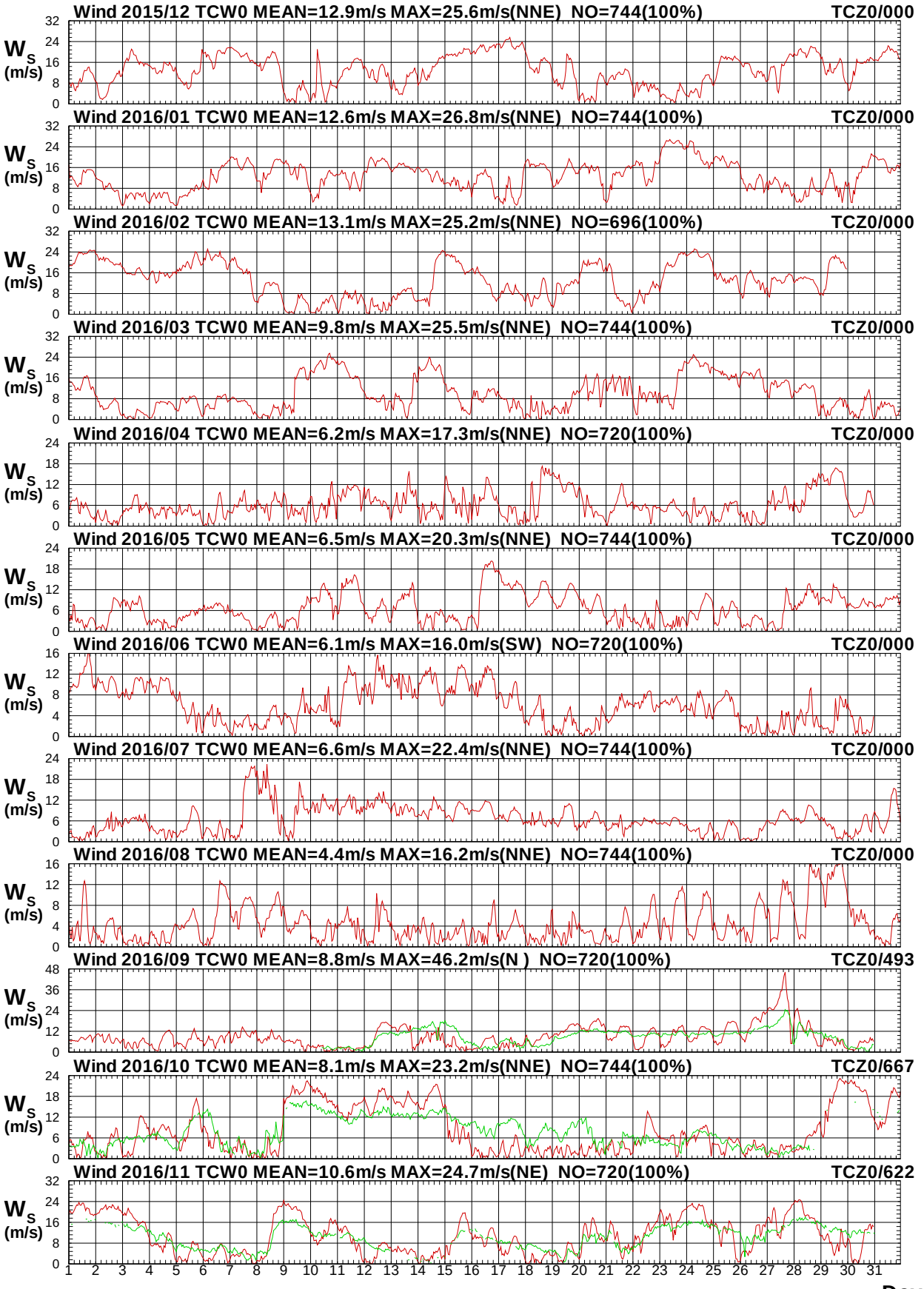

圖1.4a　2016年每月中雲海域 W 站與 Z 站風速比較圖

W15CTCW0.1HA W15CTCZ0.1H0 W161TCW0.1HA W161TCZ0.1H0 W162TCW0.1HA W162TCZ0.1H0
W163TCW0.1HA W163TCZ0.1H0 W164TCW0.1HA W164TCZ0.1H0 W165TCW0.1HA W165TCZ0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

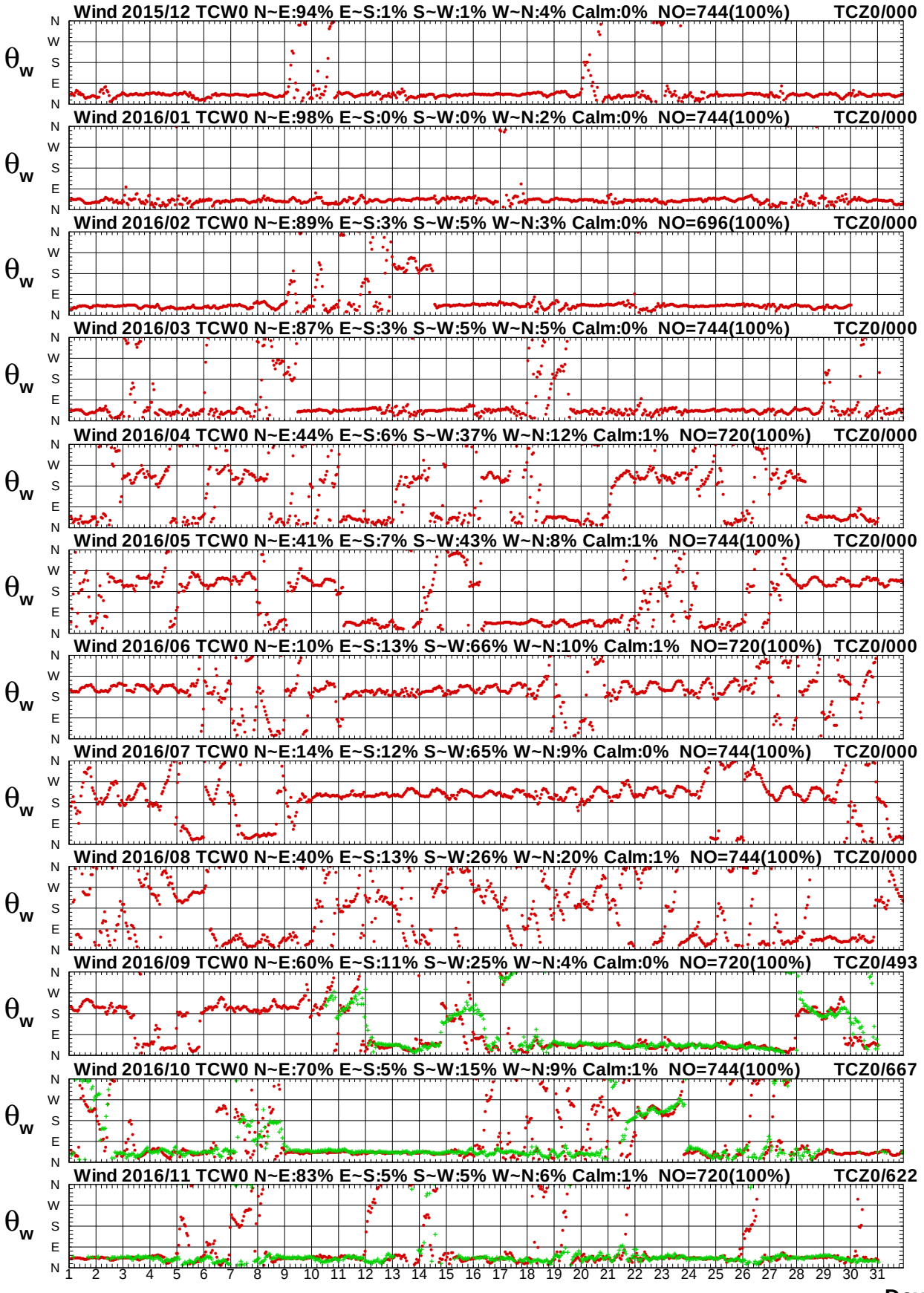

圖1.4b　2016年每月中雲海域 W 站與 Z 站風向比較圖

W15CTCW0.1HA W15CTCZ0.1H0 W161TCW0.1HA W161TCZ0.1H0 W162TCW0.1HA W162TCZ0.1H0
W163TCW0.1HA W163TCZ0.1H0 W164TCW0.1HA W164TCZ0.1H0 W165TCW0.1HA W165TCZ0.1H0

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Wind Speed in Chung-Yun Seas of TCW0 at 2016

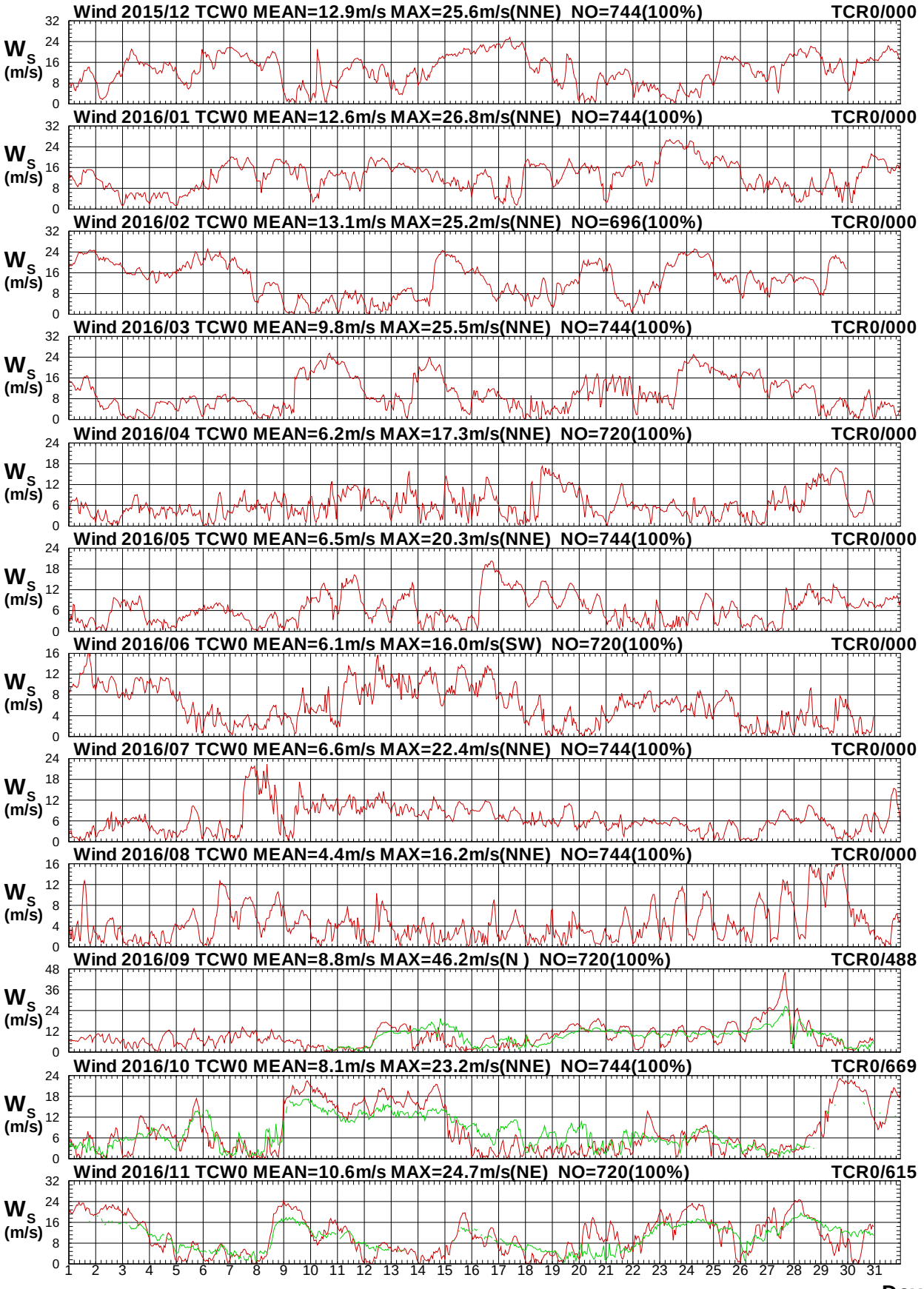

圖1.5a　2016年每月中雲海域 W 站與 R 站風速比較圖

W15CTCW0.1HA W15CTCR0.1H0 W161TCW0.1HA W161TCR0.1H0 W162TCW0.1HA W162TCR0.1H0
W163TCW0.1HA W163TCR0.1H0 W164TCW0.1HA W164TCR0.1H0 W165TCW0.1HA W165TCR0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

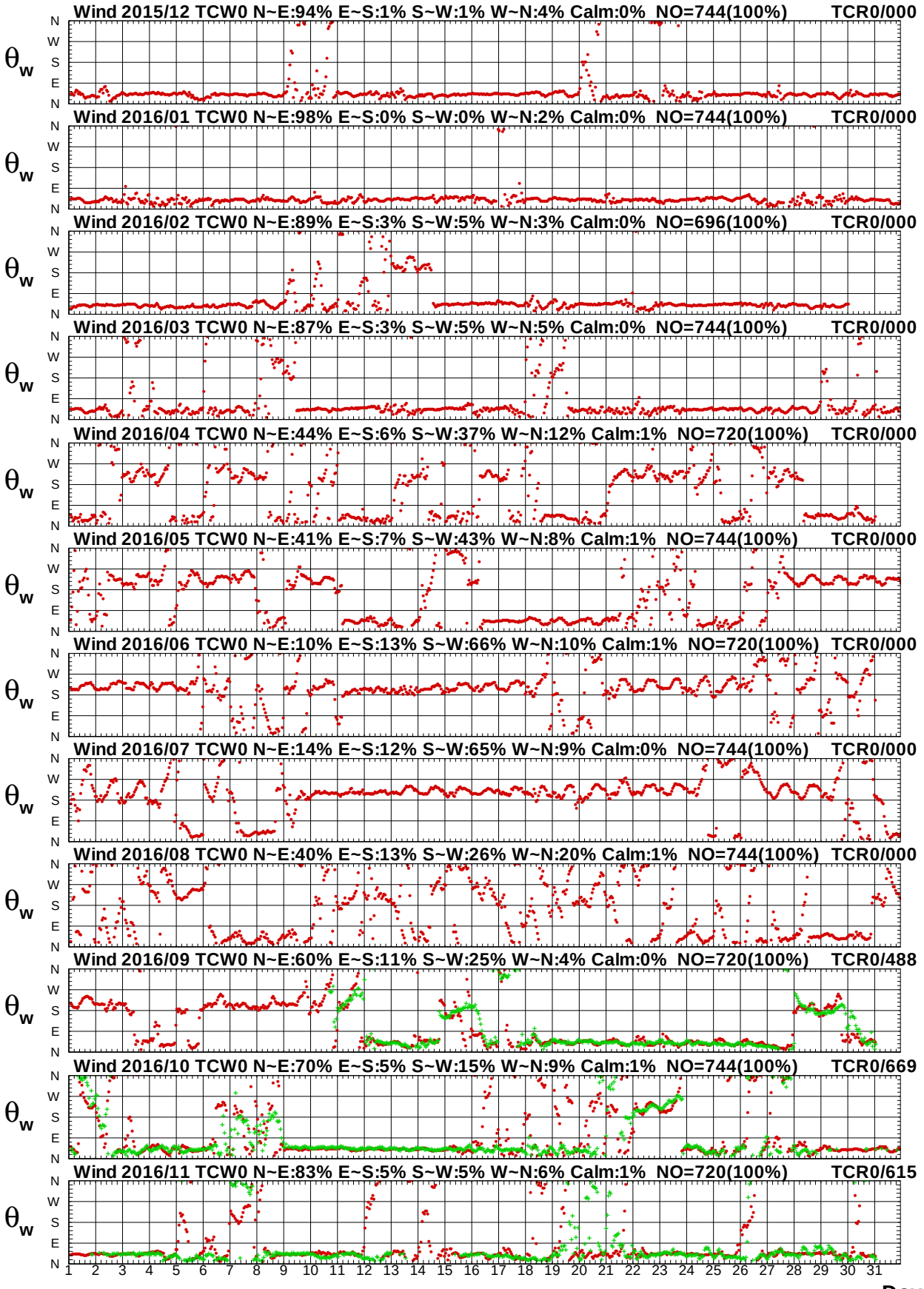

圖 1.5b　2016年每月中雲海域 W 站與 R 站風向比較圖

W15CTCW0.1HA W15CTCR0.1H0 W161TCW0.1HA W161TCR0.1H0 W162TCW0.1HA W162TCR0.1H0
W163TCW0.1HA W163TCR0.1H0 W164TCW0.1HA W164TCR0.1H0 W165TCW0.1HA W165TCR0.1H0

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Wind Speed in Chung-Yun Seas of TCW0 at 2016

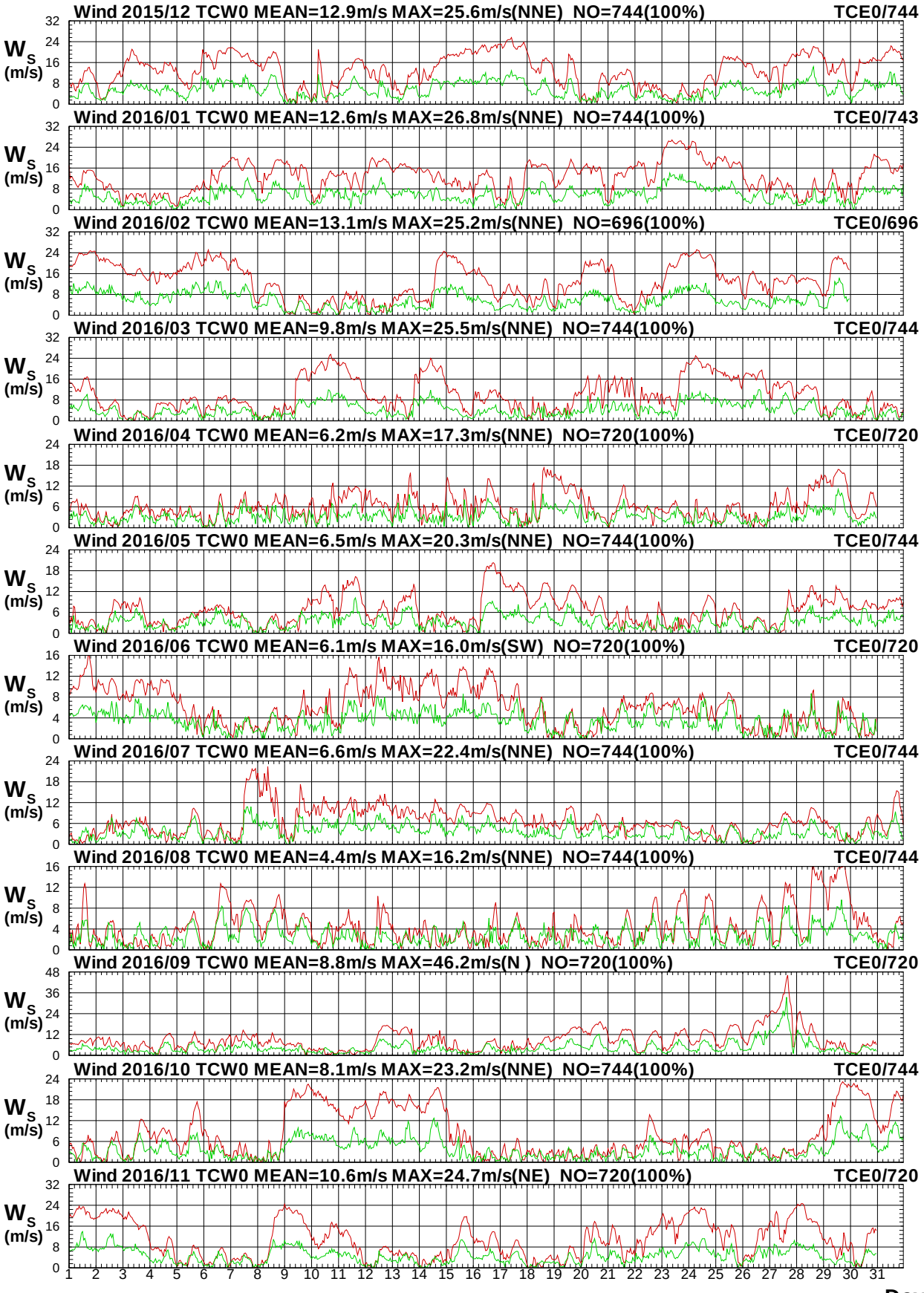

圖1.6a　2016年每月中雲海域 W 站與 E 站風速比較圖

W15CTCW0.1HA W15CTCE0.1H0 W161TCW0.1HA W161TCE0.1H0 W162TCW0.1HA W162TCE0.1H0
W163TCW0.1HA W163TCE0.1H0 W164TCW0.1HA W164TCE0.1H0 W165TCW0.1HA W165TCE0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

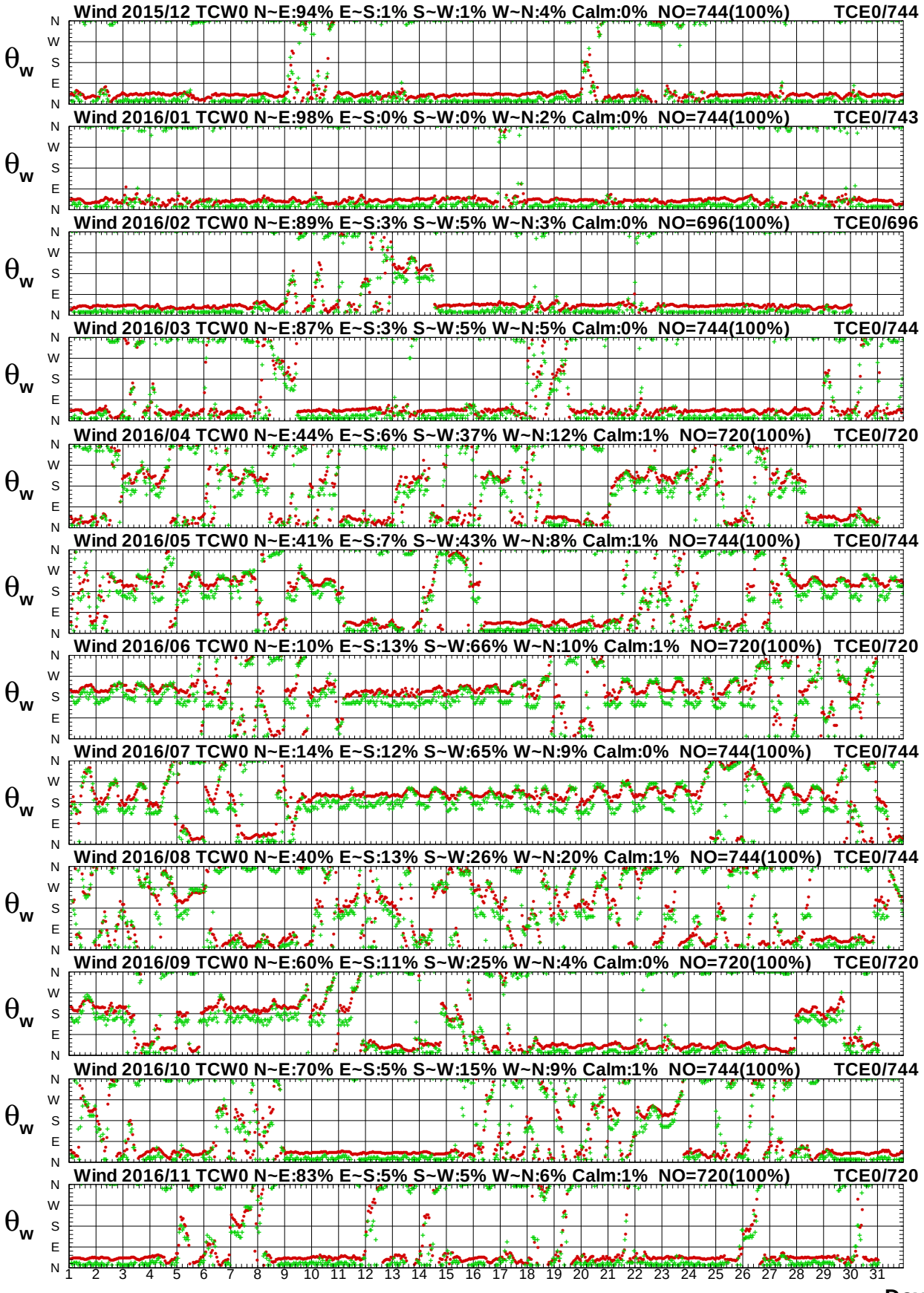

圖 1.6b　2016年每月中雲海域 W 站與 E 站風向比較圖

Wind Speed in Chung-Yun Seas of TCW0 at 2016

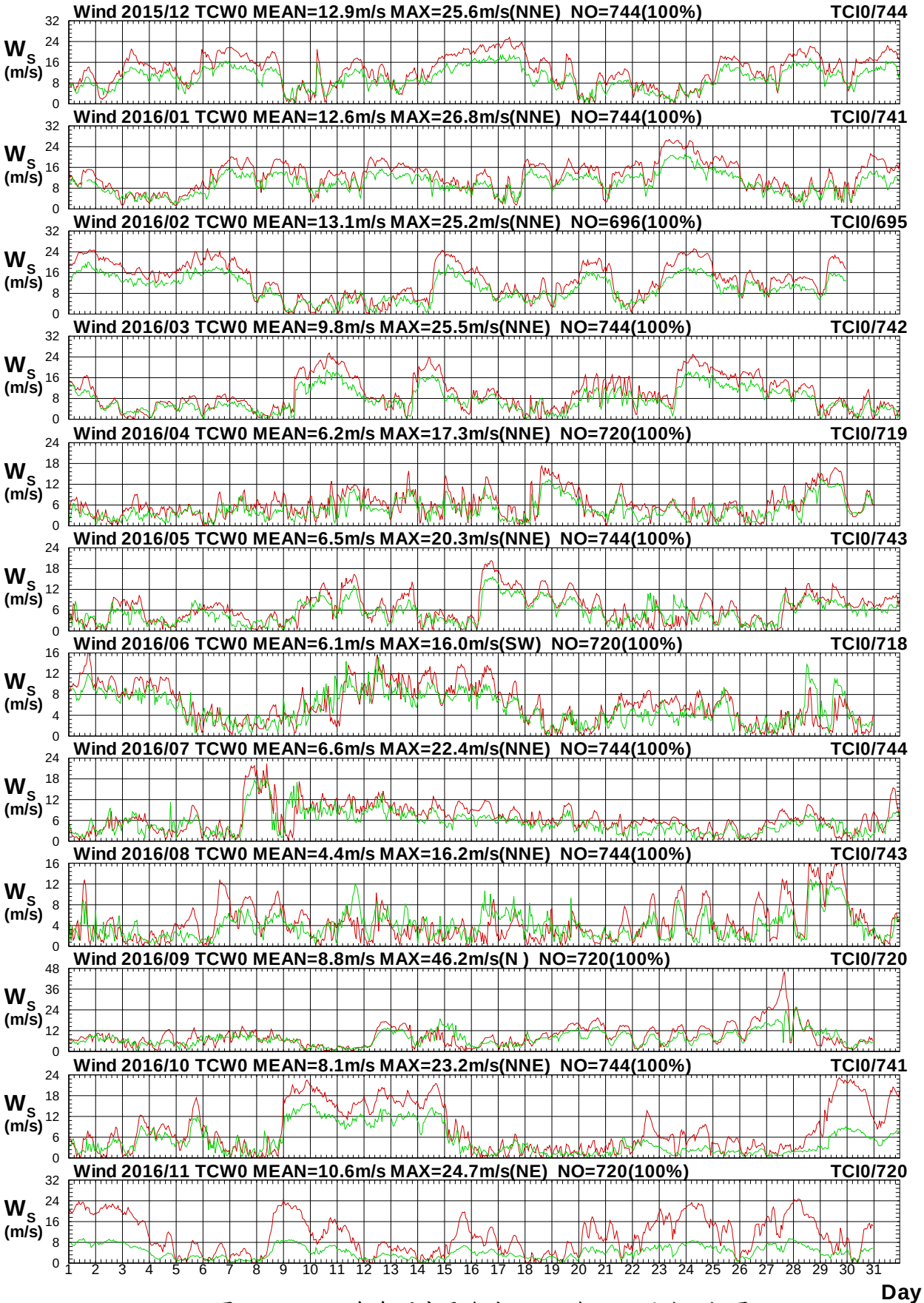

圖1.7a　2016年每月中雲海域 W 站與 I 站風速比較圖

W15CTCW0.1HA W15CTCI0.1H0 W161TCW0.1HA W161TCI0.1H0 W162TCW0.1HA W162TCI0.1H0
W163TCW0.1HA W163TCI0.1H0 W164TCW0.1HA W164TCI0.1H0 W165TCW0.1HA W165TCI0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

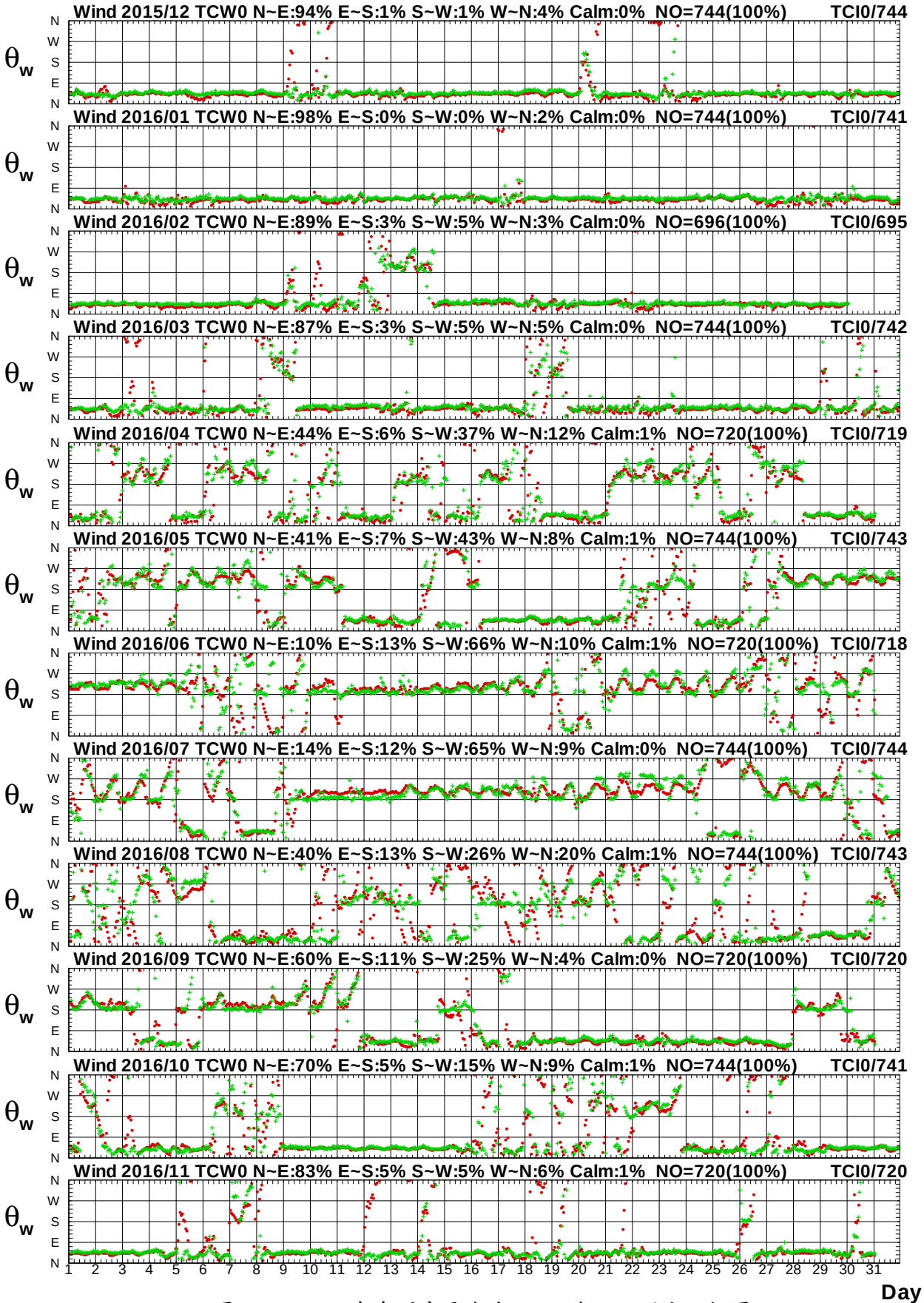

圖1.7b　2016年每月中雲海域 W 站與 I 站風向比較圖

W15CTCW0.1HA W15CTCI0.1H0 W161TCW0.1HA W161TCI0.1H0 W162TCW0.1HA W162TCI0.1H0
W163TCW0.1HA W163TCI0.1H0 W164TCW0.1HA W164TCI0.1H0 W165TCW0.1HA W165TCI0.1H0

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Wind Speed in Chung-Yun Seas of TCW0 at 2016

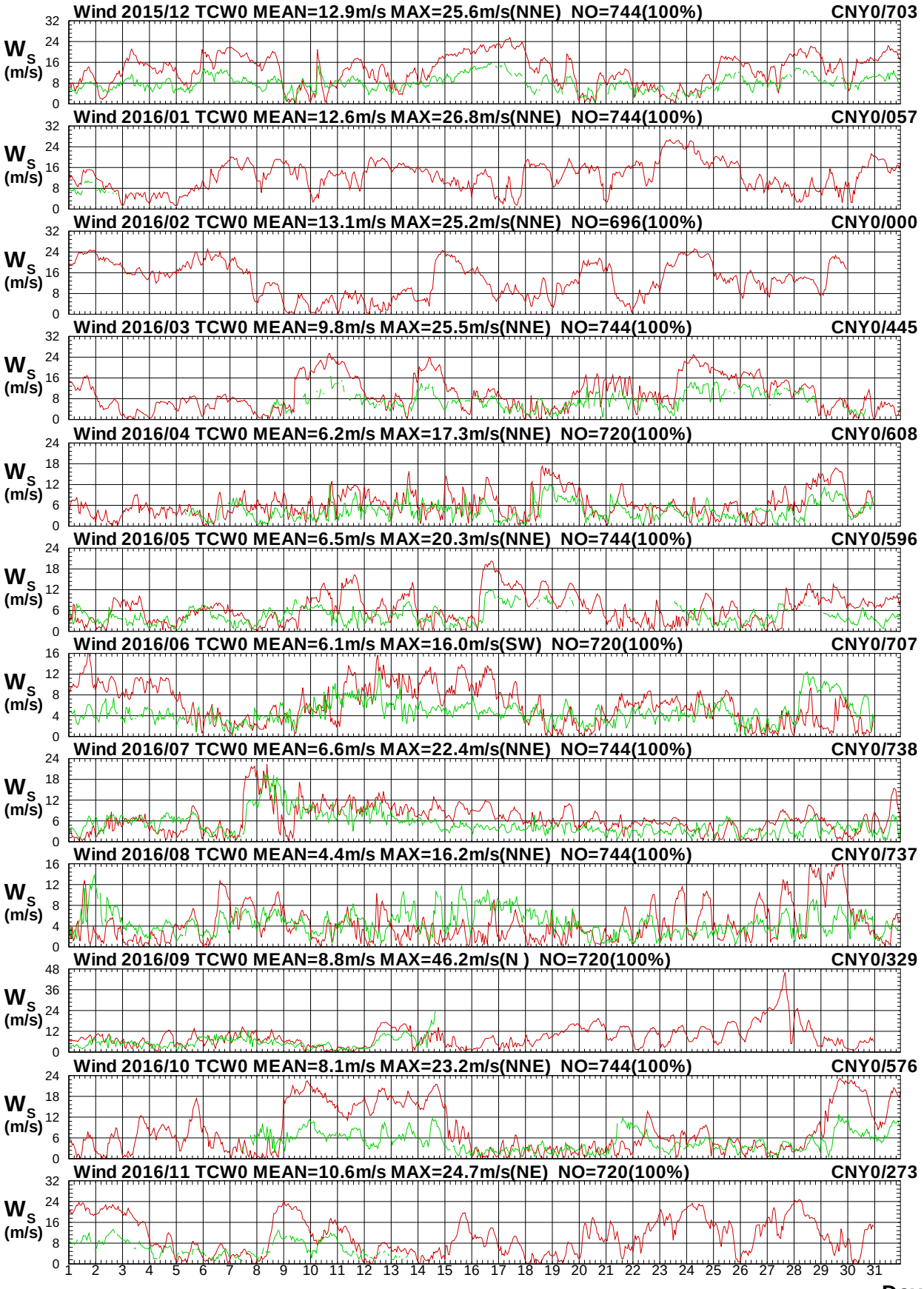

圖1.8a　2016年每月中雲海域 W 站與嘉南海域 Y 站風速圖

W15CTCW0.1HA W15CCNY0.1H0 W161TCW0.1HA W161CNY0.1H0 W162TCW0.1HA W162CNY0.1H0
W163TCW0.1HA W163CNY0.1H0 W164TCW0.1HA W164CNY0.1H0 W165TCW0.1HA W165CNY0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

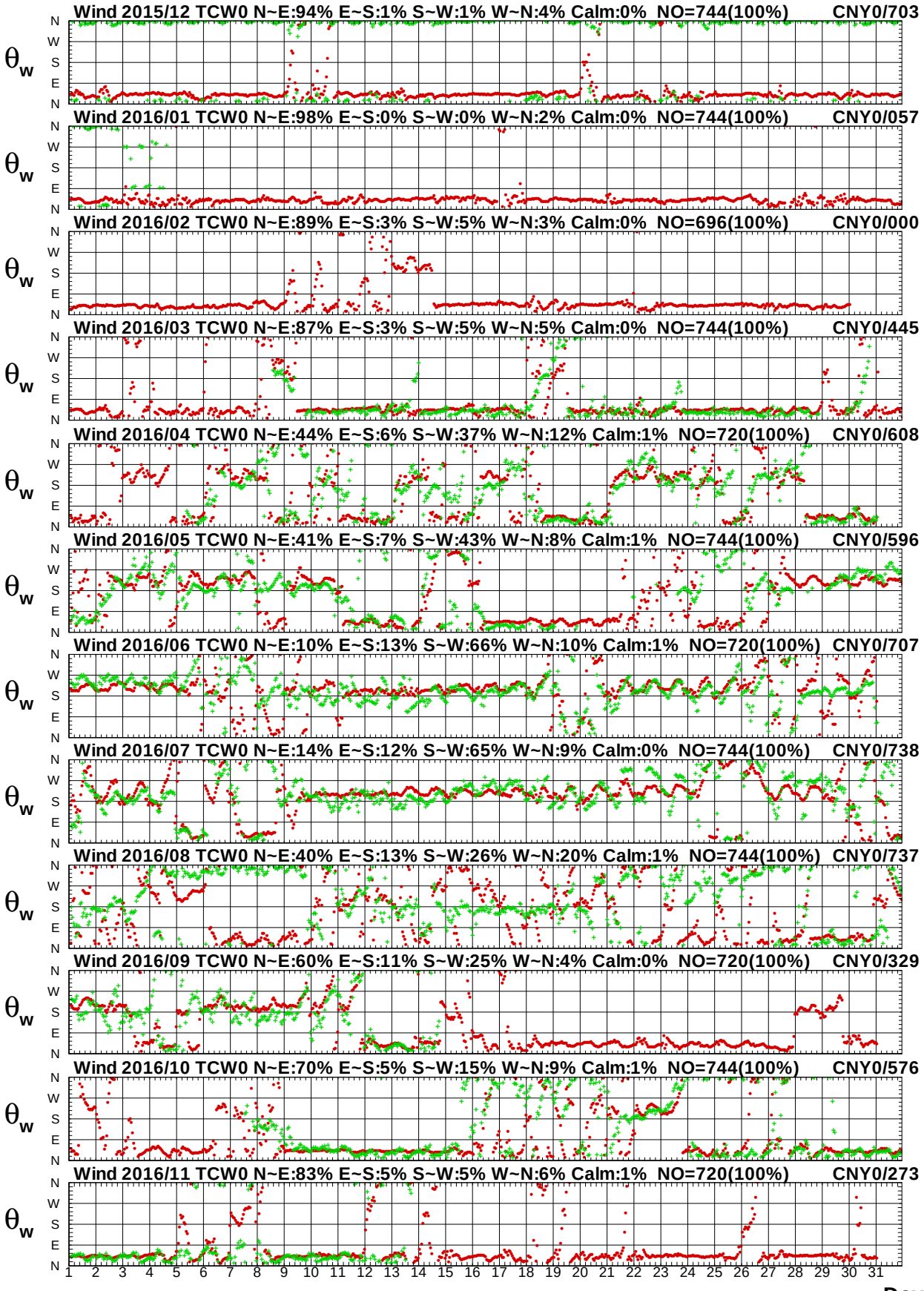

圖1.8b　2016年每月中雲海域 W 站與嘉南海域 Y 站風向圖

Wind Speed in Chung-Yun Seas of TCW0 at 2016

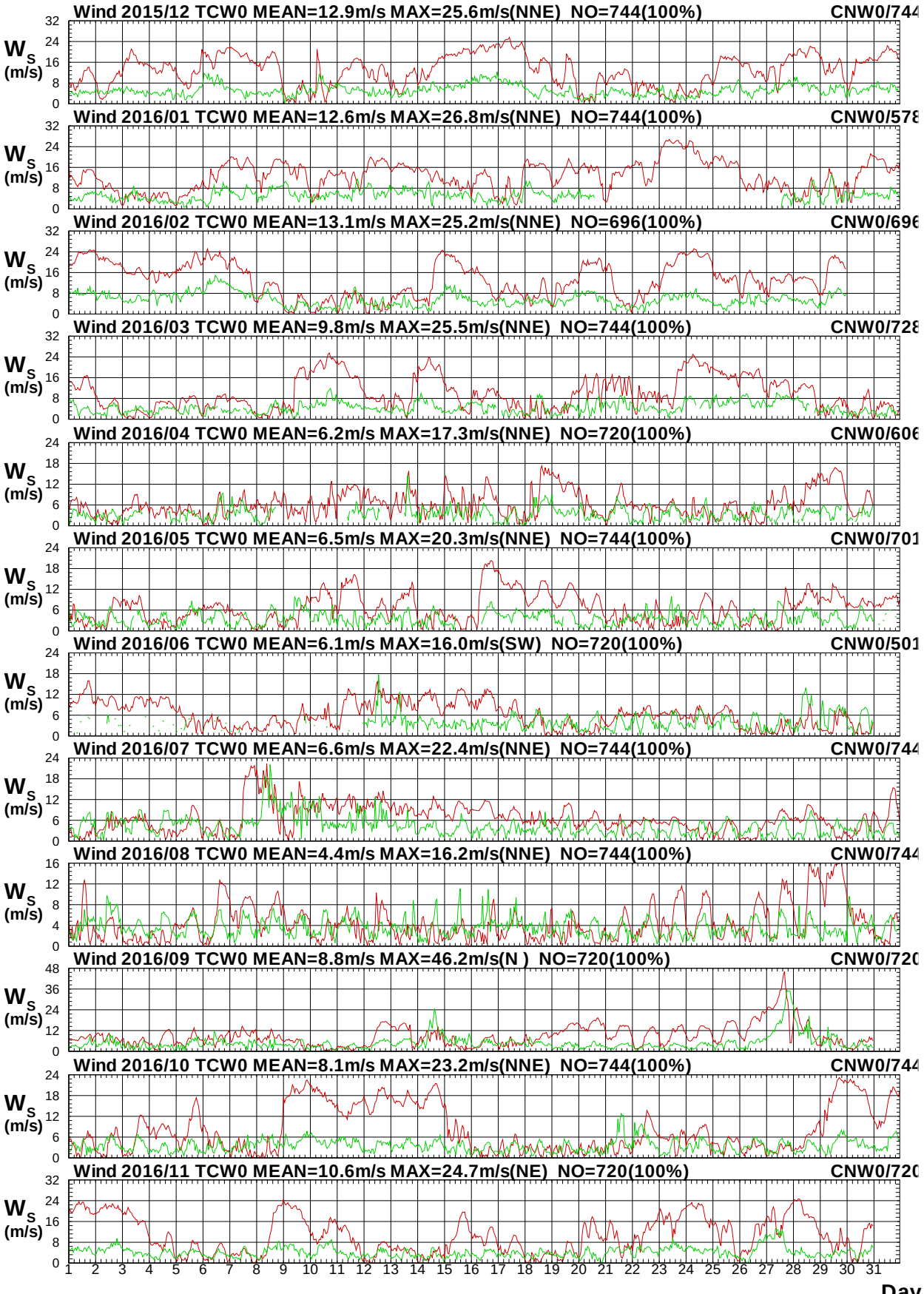

圖1.9a　2016年每月中雲海域 W 站與嘉南海域 W 站風速圖

W15CTCW0.1HA W15CCNW0.1H0 W161TCW0.1HA W161CNW0.1H0 W162TCW0.1HA W162CNW0.1H0
W163TCW0.1HA W163CNW0.1H0 W164TCW0.1HA W164CNW0.1H0 W165TCW0.1HA W165CNW0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

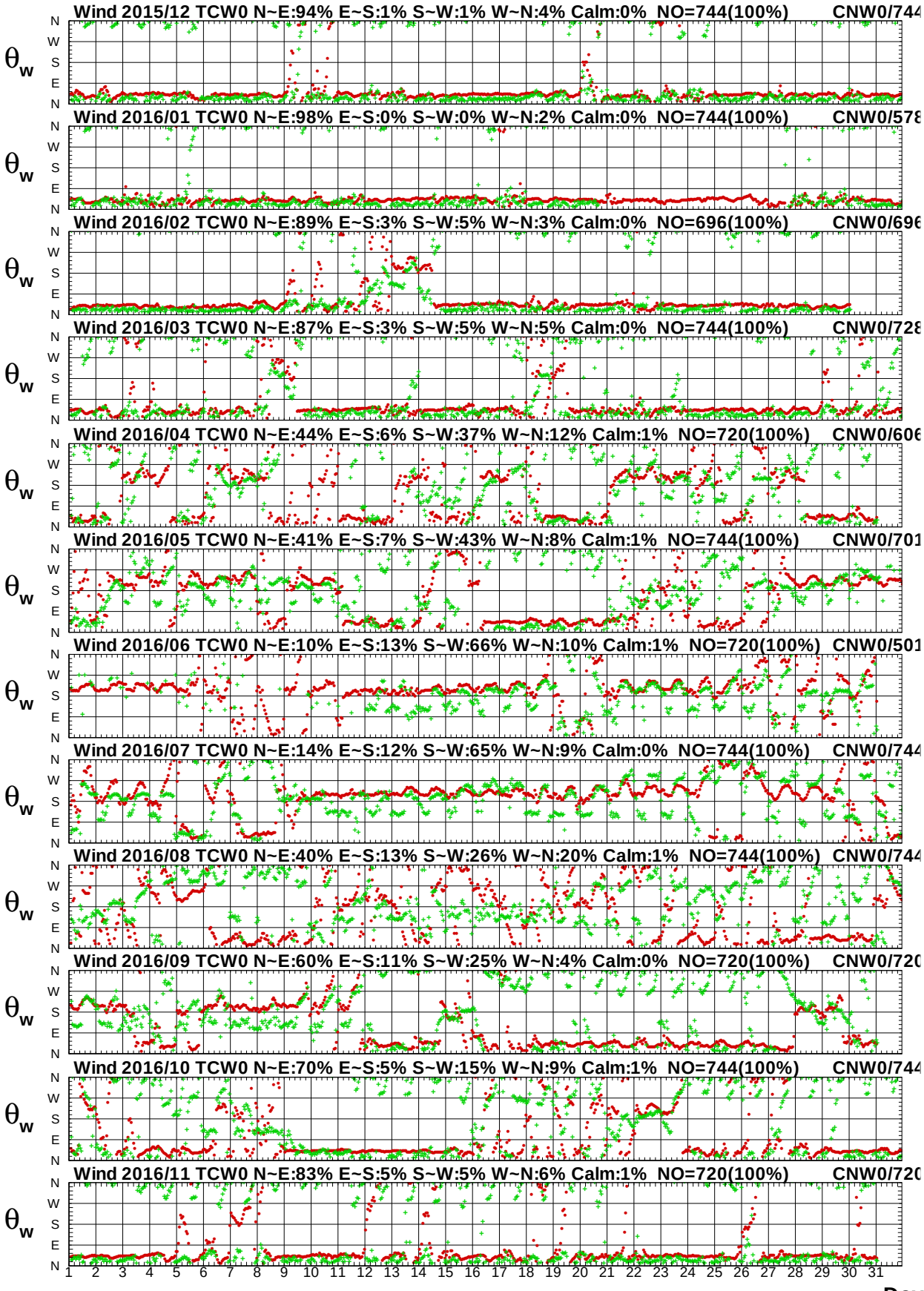

圖 1.9b　2016年每月中雲海域 W 站與嘉南海域 W 站風向圖

W15CTCW0.1HA W15CCNW0.1H0 W161TCW0.1HA W161CNW0.1H0 W162TCW0.1HA W162CNW0.1H0
W163TCW0.1HA W163CNW0.1H0 W164TCW0.1HA W164CNW0.1H0 W165TCW0.1HA W165CNW0.1H0

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Wind Speed in Chung-Yun Seas of TCW0 at 2016

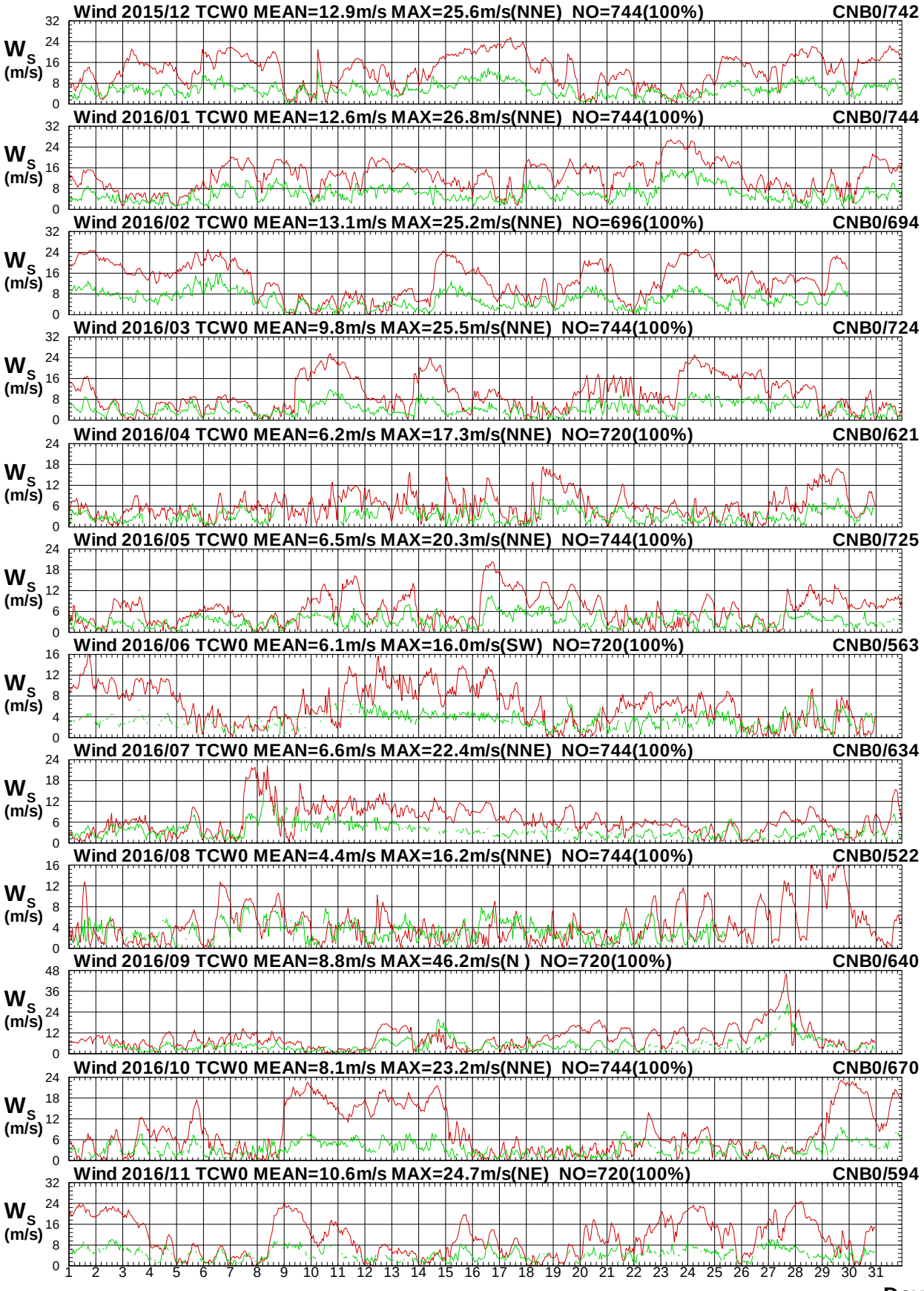

圖 1.10a　2016年每月中雲海域 W 站與嘉南海域 B 站風速圖

W15CTCW0.1HA W15CCNB0.1H0 W161TCW0.1HA W161CNB0.1H0 W162TCW0.1HA W162CNB0.1H0
W163TCW0.1HA W163CNB0.1H0 W164TCW0.1HA W164CNB0.1H0 W165TCW0.1HA W165CNB0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

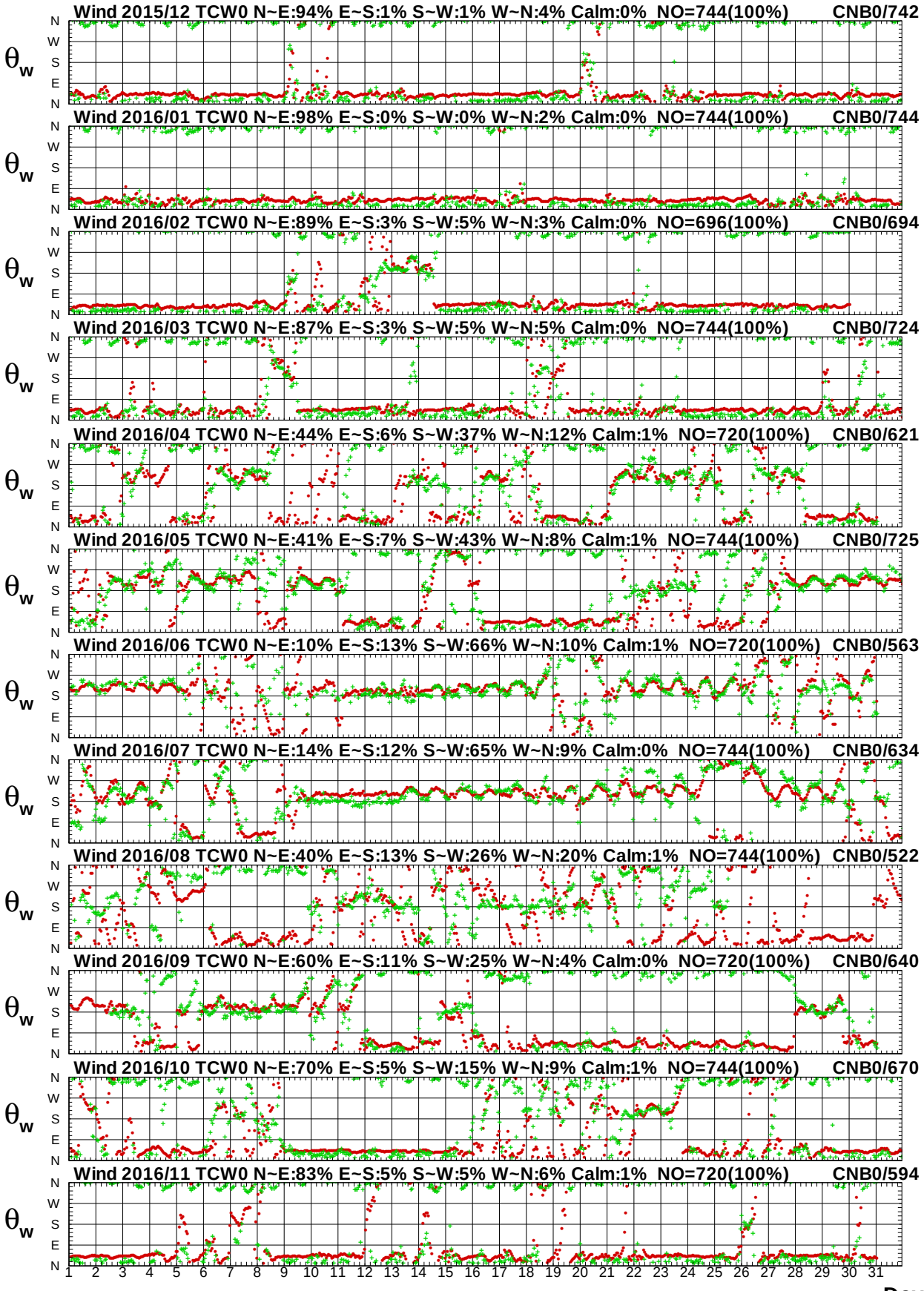

圖1.10b　2016年每月中雲海域 W 站與嘉南海域 B 站風向圖

Wind Speed in Chung-Yun Seas of TCW0 at 2016

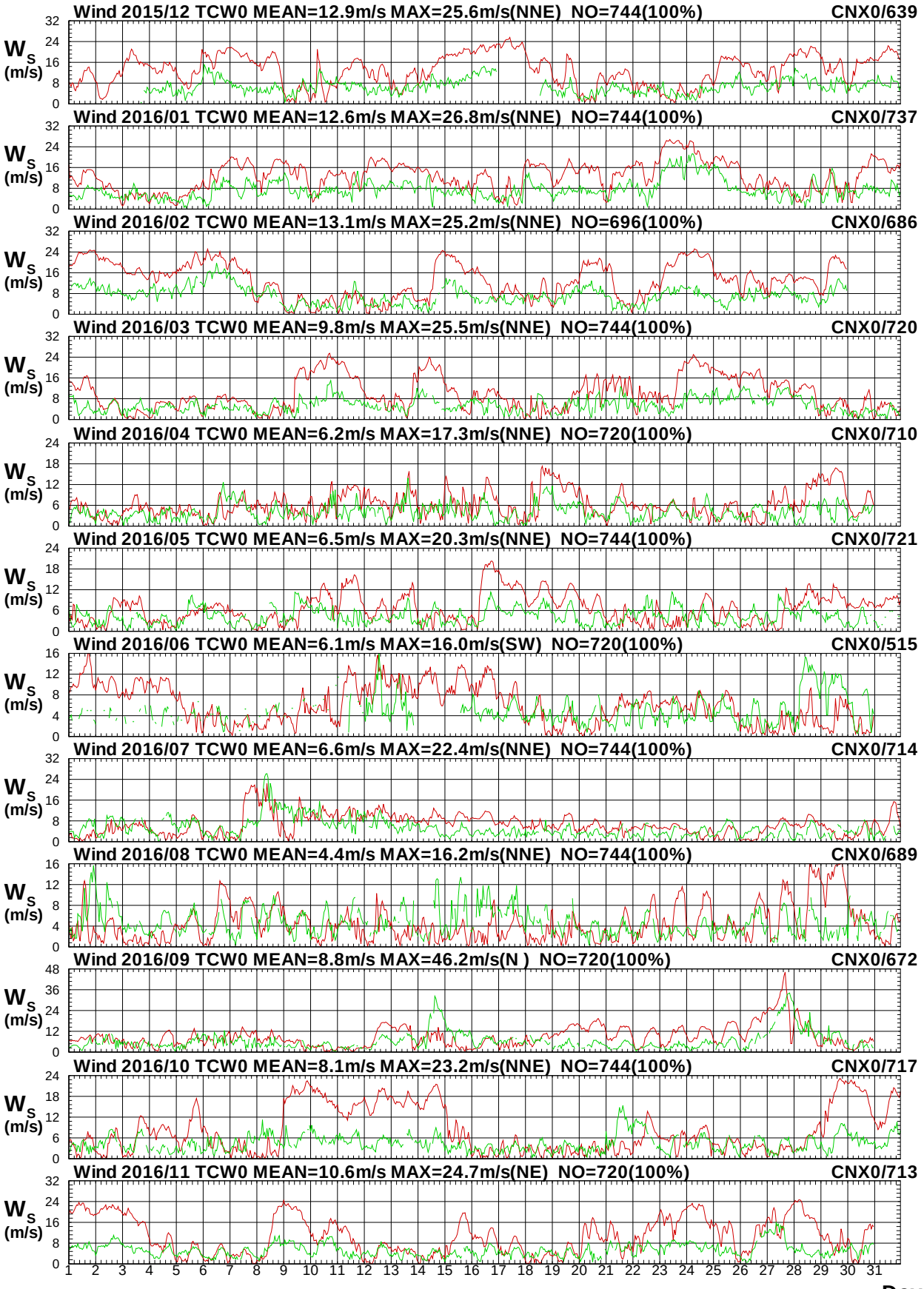

圖1.11a　2016年每月中雲海域 W 站與嘉南海域 X 站風速圖

Wind Direction in Chung-Yun Seas of TCW0 at 2016

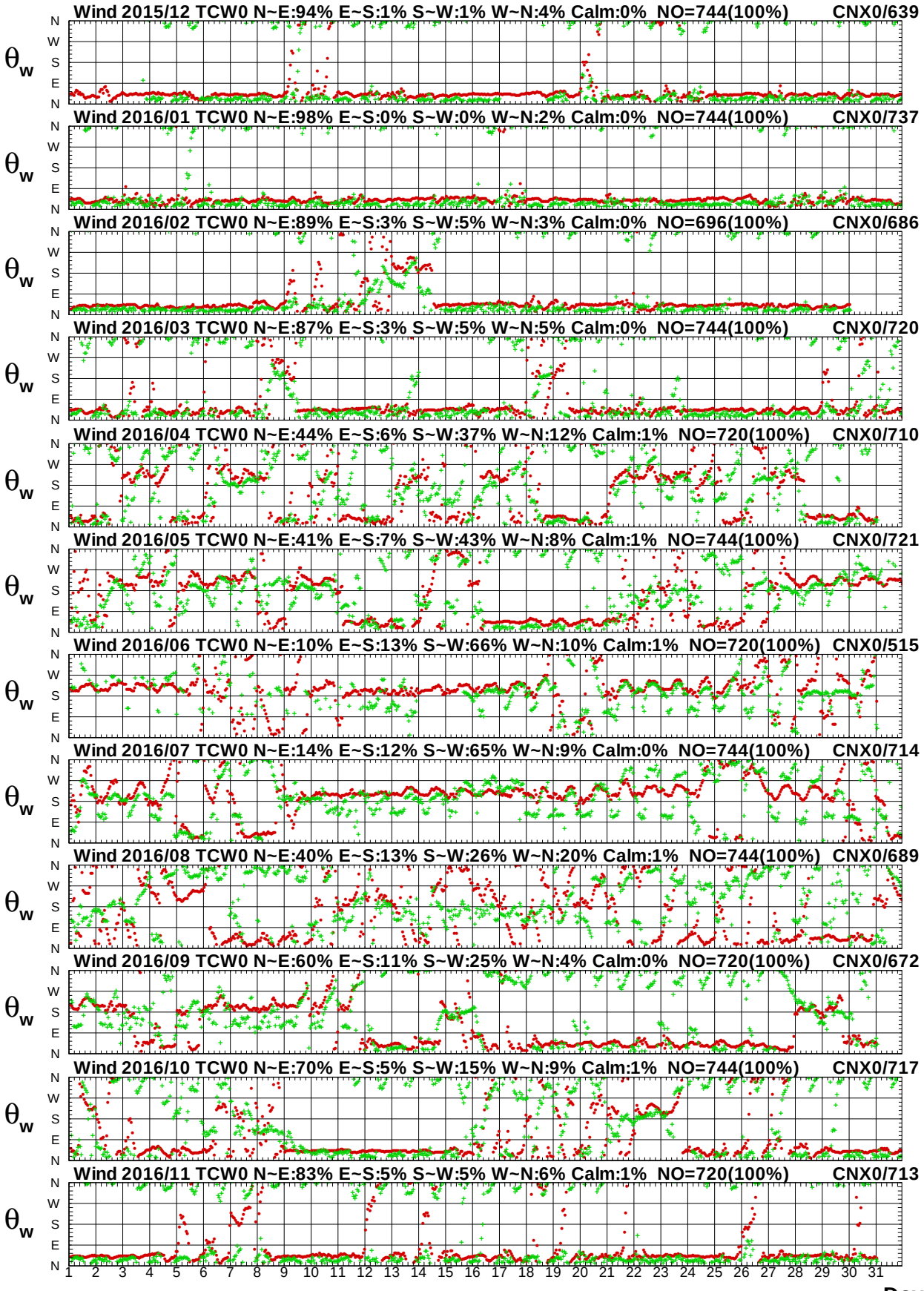

圖1.11b　2016年每月中雲海域 W 站與嘉南海域 X 站風向圖

Wind Speed in Chung-Yun Seas of TCW0 at 2016

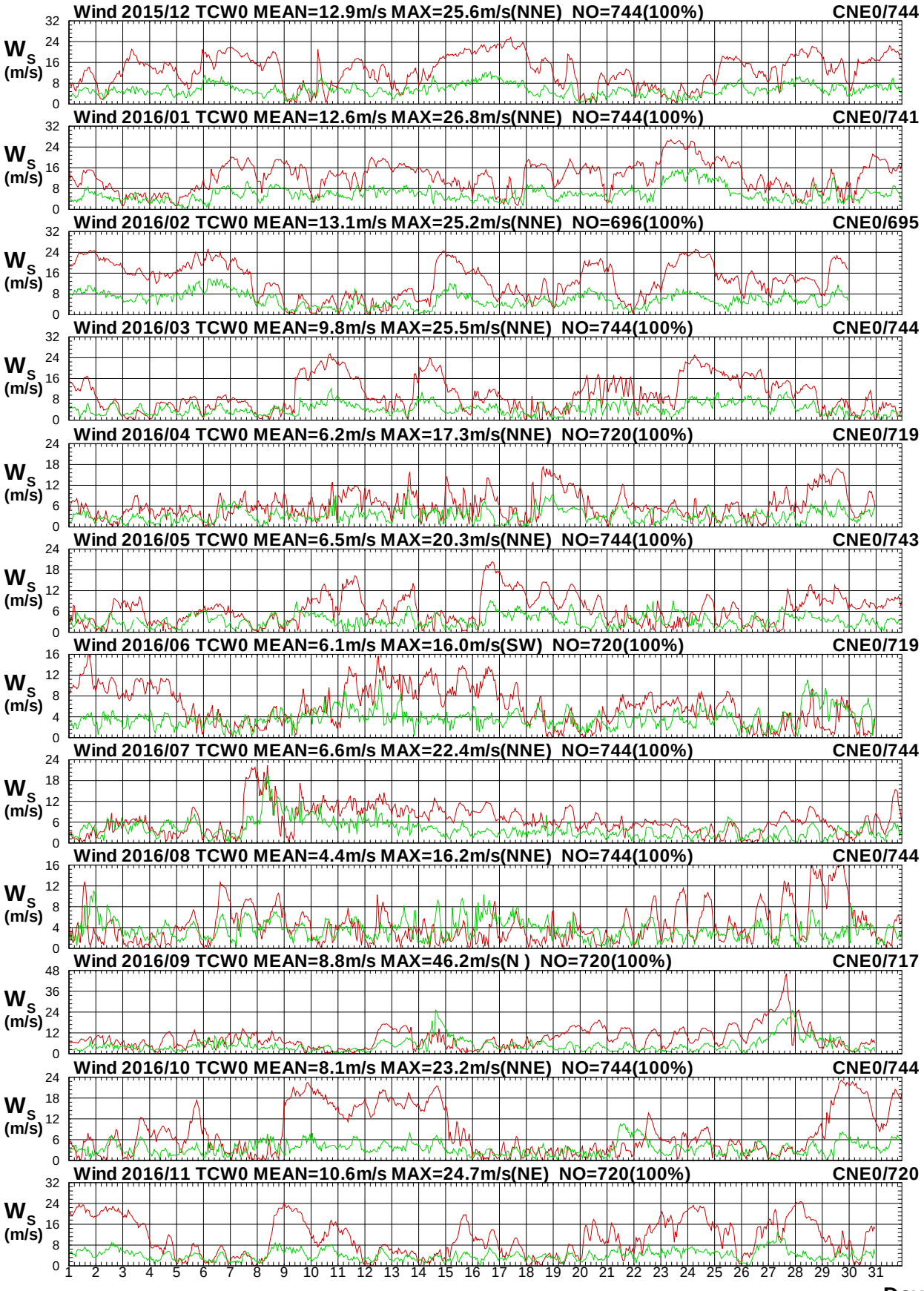

圖1.12a　2016年每月中雲海域 W 站與嘉南海域 E 站風速圖

W15CTCW0.1HA W15CCNE0.1H0 W161TCW0.1HA W161CNE0.1H0 W162TCW0.1HA W162CNE0.1H0
W163TCW0.1HA W163CNE0.1H0 W164TCW0.1HA W164CNE0.1H0 W165TCW0.1HA W165CNE0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

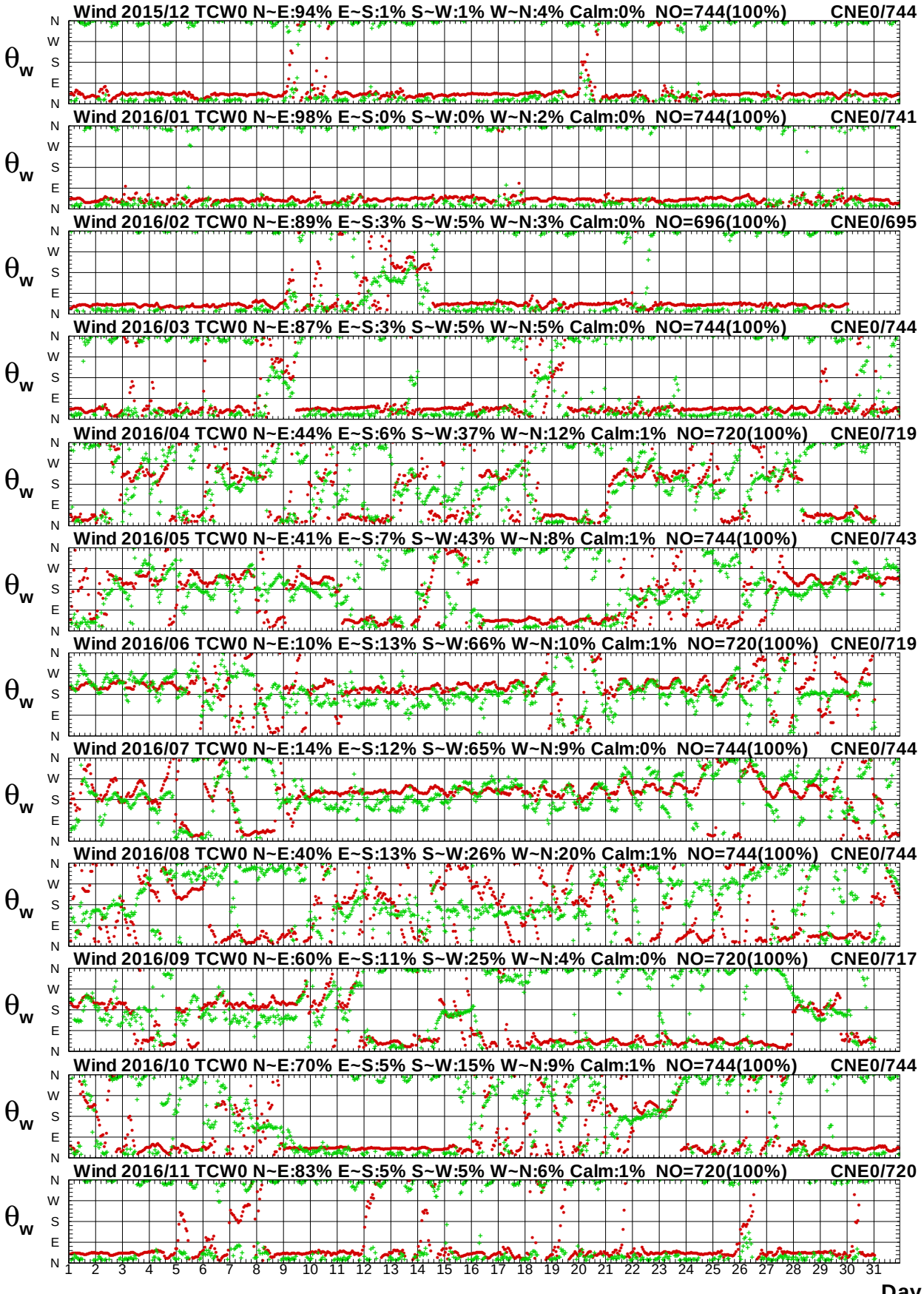

圖1.12b　2016年每月中雲海域 W 站與嘉南海域 E 站風向圖

W15CTCW0.1HA W15CCNE0.1H0 W161TCW0.1HA W161CNE0.1H0 W162TCW0.1HA W162CNE0.1H0
W163TCW0.1HA W163CNE0.1H0 W164TCW0.1HA W164CNE0.1H0 W165TCW0.1HA W165CNE0.1H0

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Wind Speed in Chung-Yun Seas of TCW0 at 2016

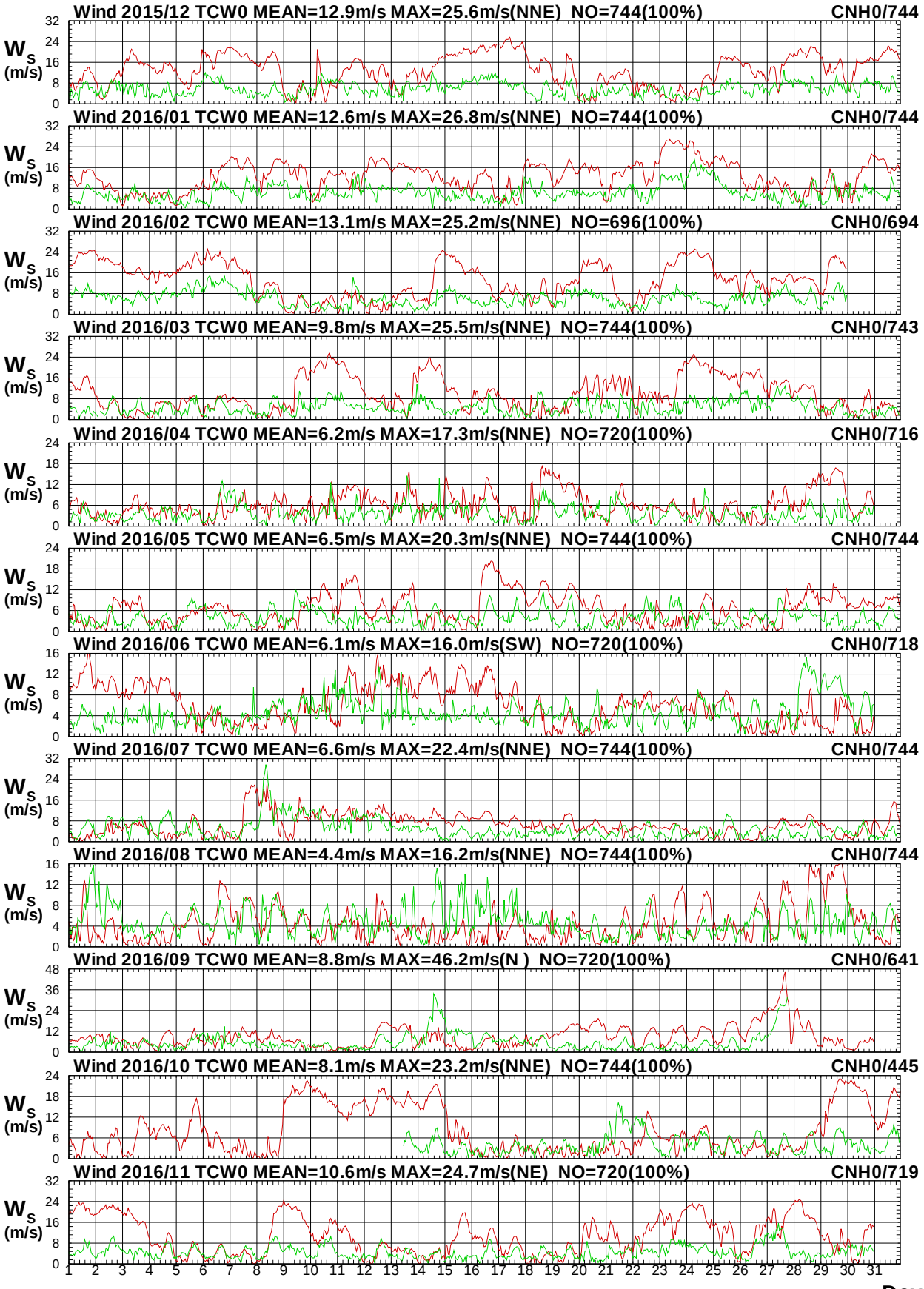

圖1.13a　2016年每月中雲海域 W 站與嘉南海域 H 站風速圖

W15CTCW0.1HA W15CCNH0.1H0 W161TCW0.1HA W161CNH0.1H0 W162TCW0.1HA W162CNH0.1H0
W163TCW0.1HA W163CNH0.1H0 W164TCW0.1HA W164CNH0.1H0 W165TCW0.1HA W165CNH0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

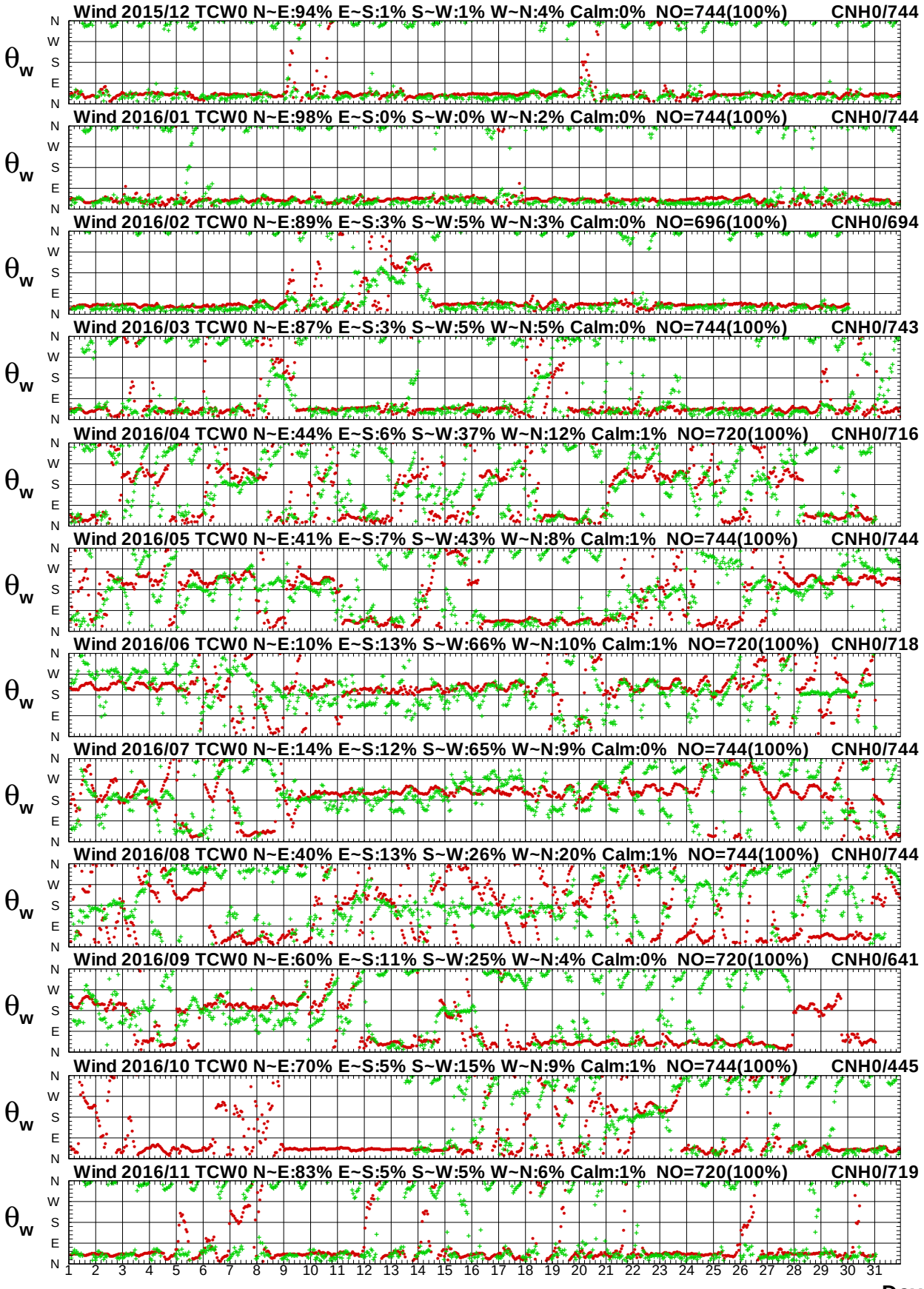

圖1.13b　2016年每月中雲海域 W 站與嘉南海域 H 站風向圖

Wind Speed in Chung-Yun Seas of TCW0 at 2016

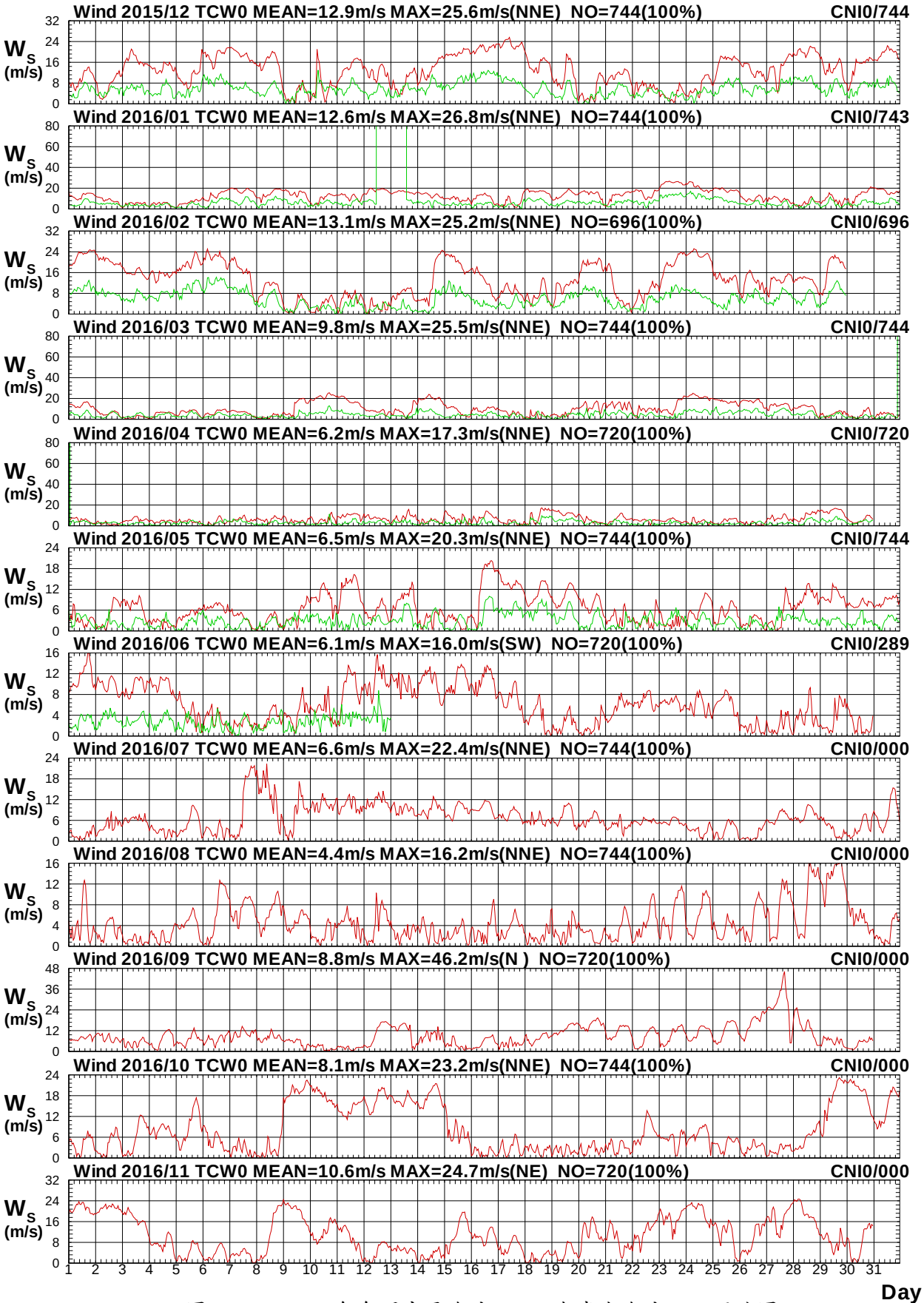

圖 1.14a　2016年每月中雲海域 W 站與嘉南海域 I 站風速圖

W15CTCW0.1HA W15CCNI0.1H0 W161TCW0.1HA W161CNI0.1H0 W162TCW0.1HA W162CNI0.1H0
W163TCW0.1HA W163CNI0.1H0 W164TCW0.1HA W164CNI0.1H0 W165TCW0.1HA W165CNI0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

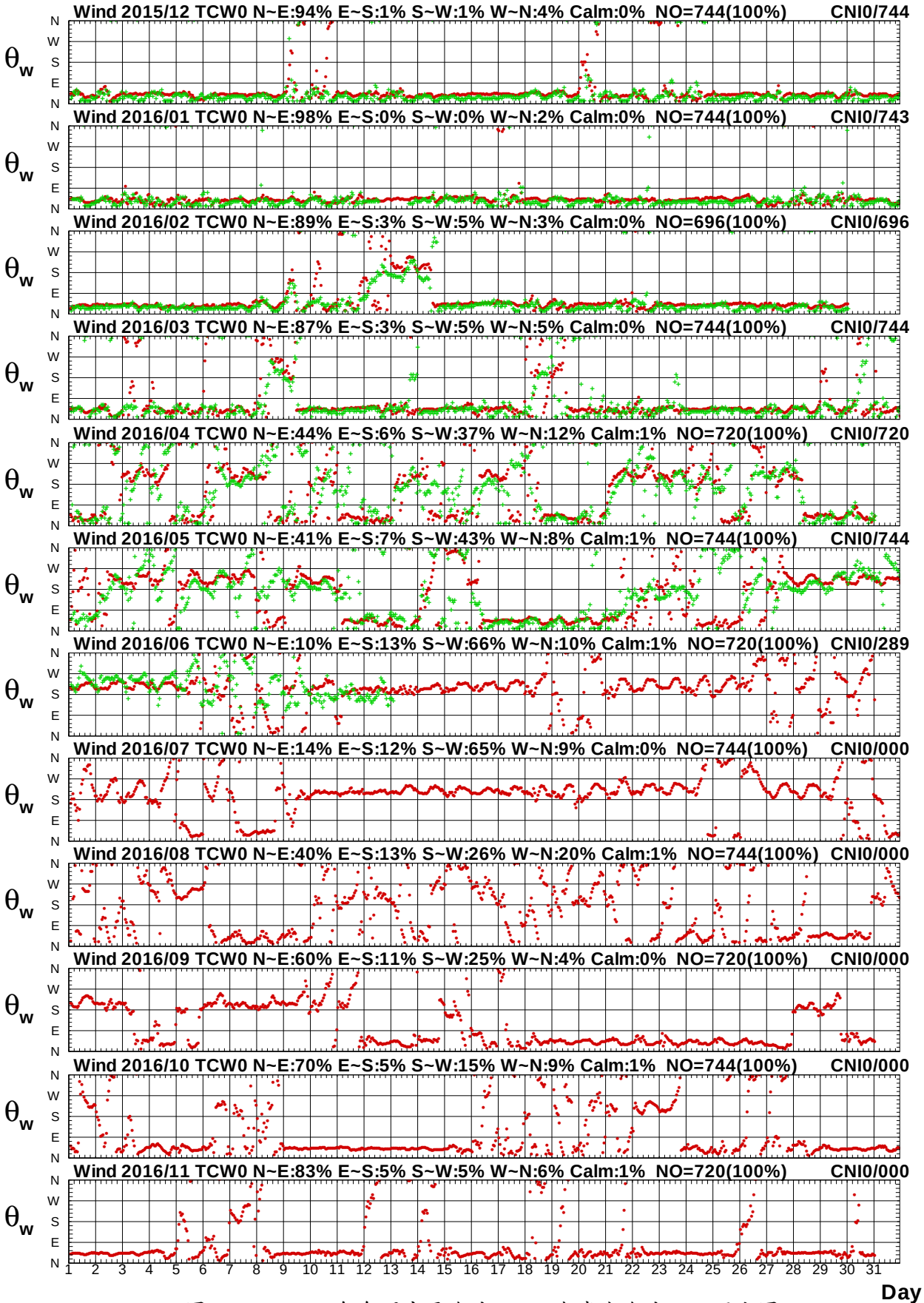

圖1.14b　2016年每月中雲海域 W 站與嘉南海域 I 站風向圖

Wind Speed in Chung-Yun Seas of TCW0 at 2016

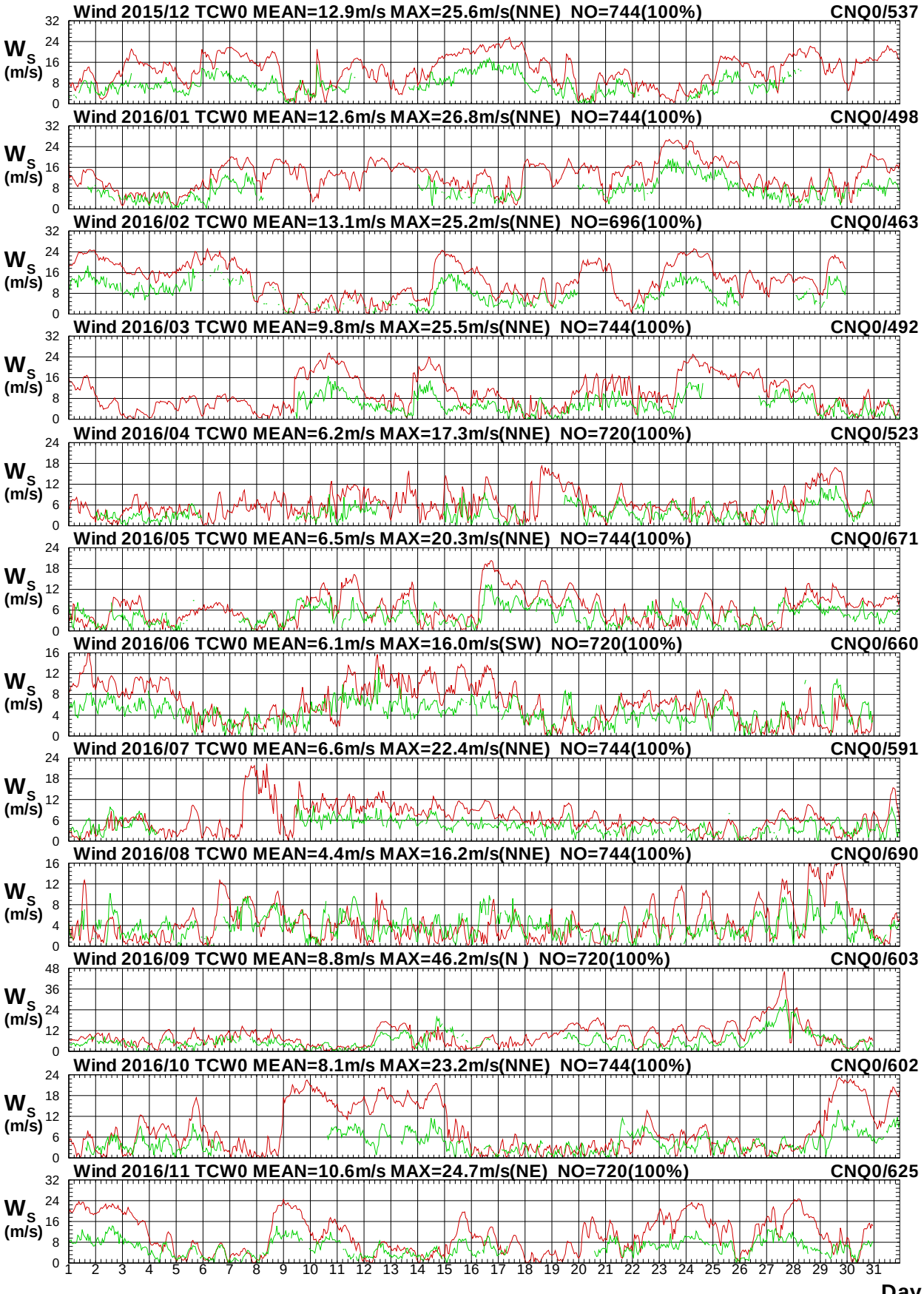

圖1.15a　2016年每月中雲海域 W 站與嘉南海域 Q 站風速圖

W15CTCW0.1HA W15CCNQ0.1H0 W161TCW0.1HA W161CNQ0.1H0 W162TCW0.1HA W162CNQ0.1H0
W163TCW0.1HA W163CNQ0.1H0 W164TCW0.1HA W164CNQ0.1H0 W165TCW0.1HA W165CNQ0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

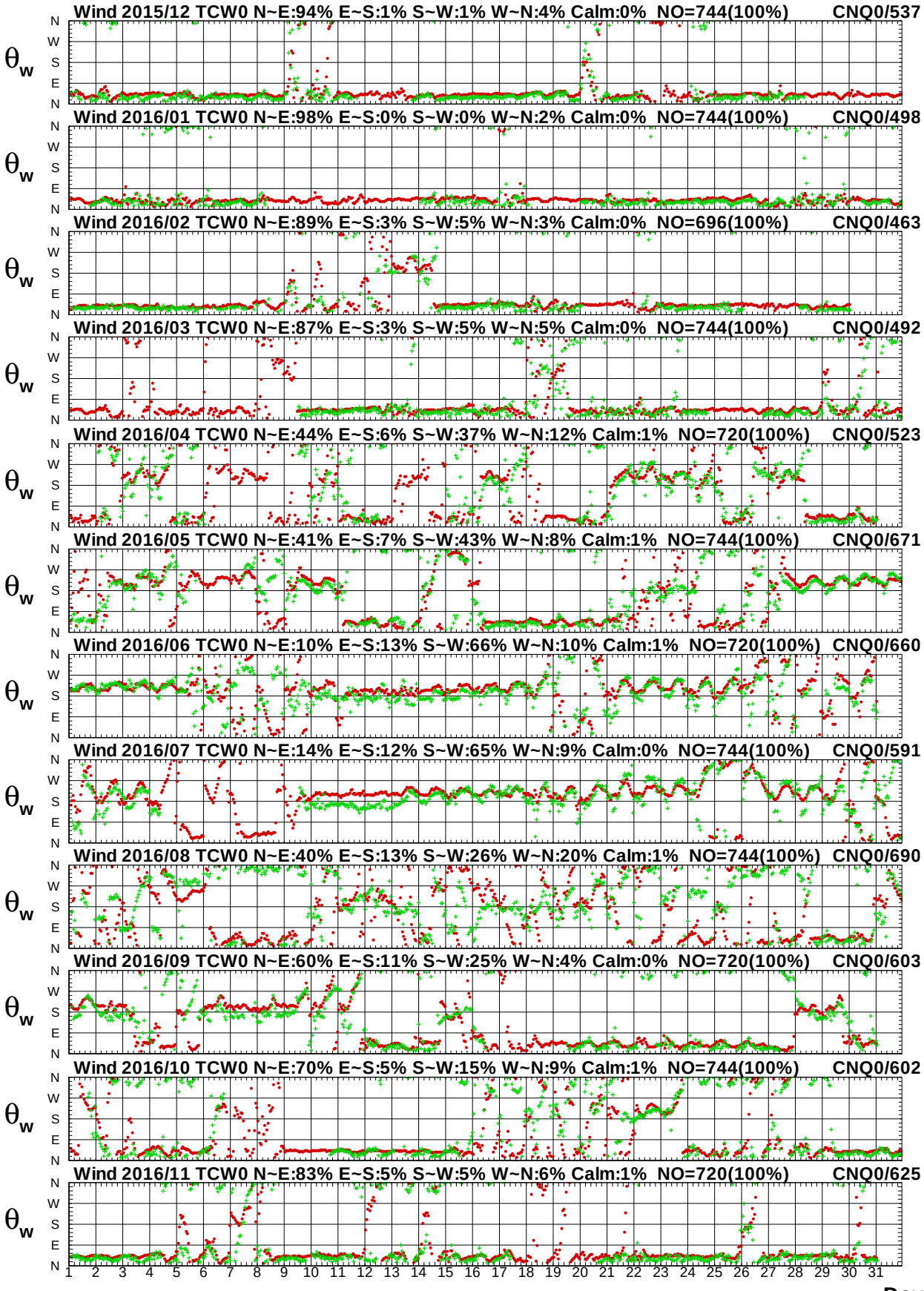

圖 1.15b　2016年每月中雲海域 W 站與嘉南海域 Q 站風向圖

Wind Speed in Chung-Yun Seas of TCW0 at 2016

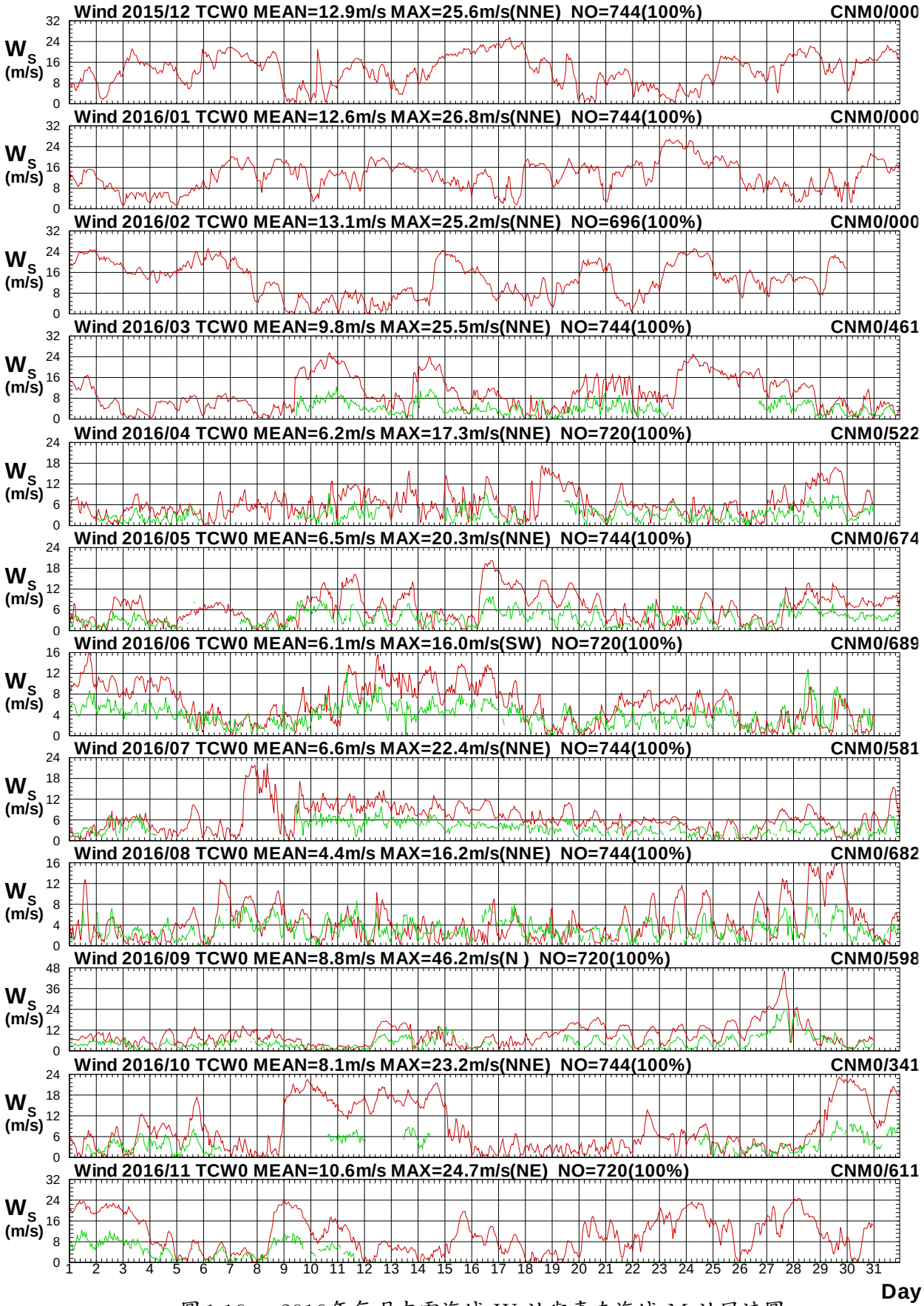

圖 1.16a　2016年每月中雲海域 W 站與嘉南海域 M 站風速圖

W15CTCW0.1HA W15CCNM0.1H0 W161TCW0.1HA W161CNM0.1H0 W162TCW0.1HA W162CNM0.1H0
W163TCW0.1HA W163CNM0.1H0 W164TCW0.1HA W164CNM0.1H0 W165TCW0.1HA W165CNM0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

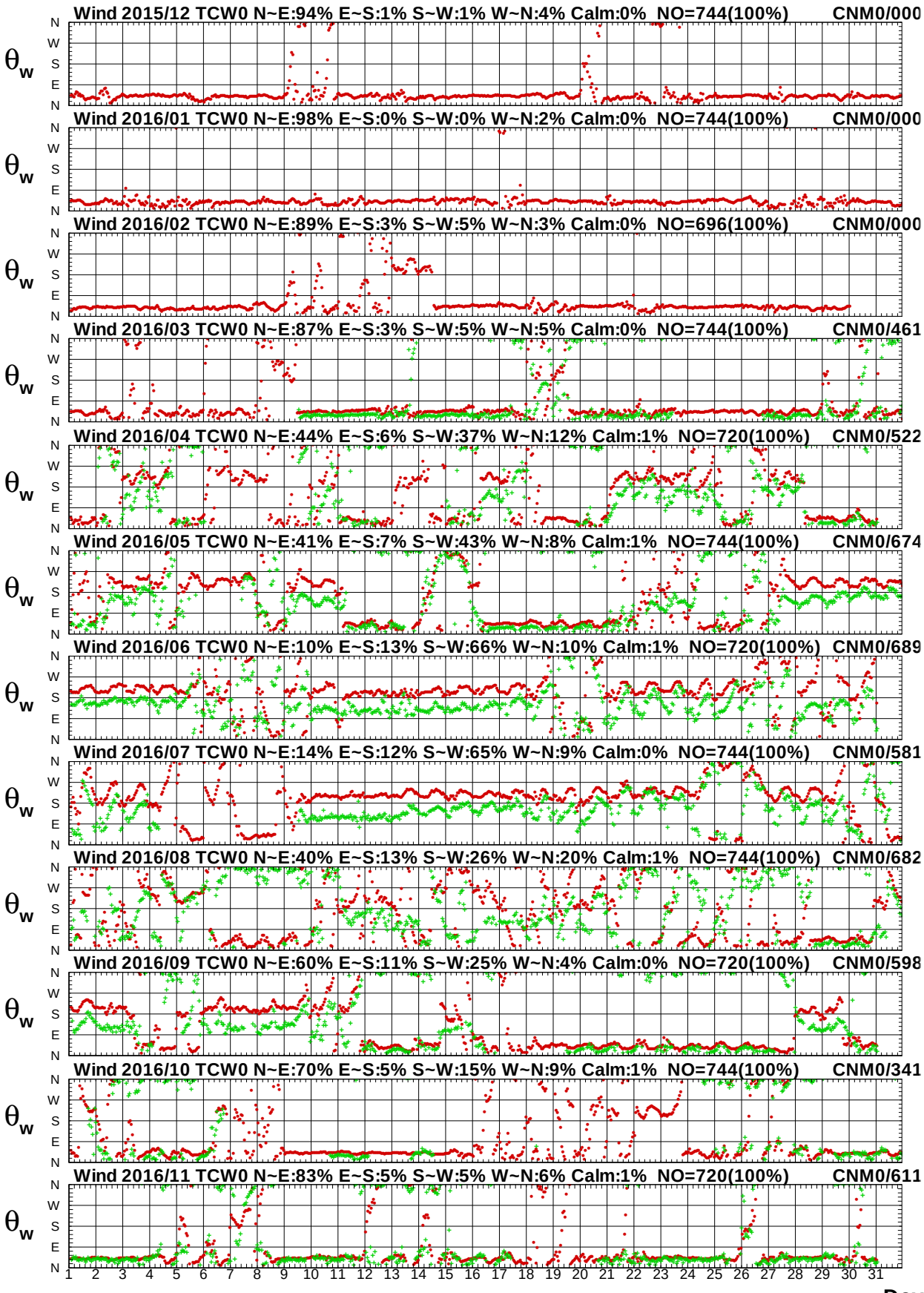

圖 1.16b　2016年每月中雲海域 W 站與嘉南海域 M 站風向圖

W15CTCW0.1HA W15CCNM0.1H0 W161TCW0.1HA W161CNM0.1H0 W162TCW0.1HA W162CNM0.1H0
W163TCW0.1HA W163CNM0.1H0 W164TCW0.1HA W164CNM0.1H0 W165TCW0.1HA W165CNM0.1H0

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Wind Speed in Chung-Yun Seas of TCW0 at 2016

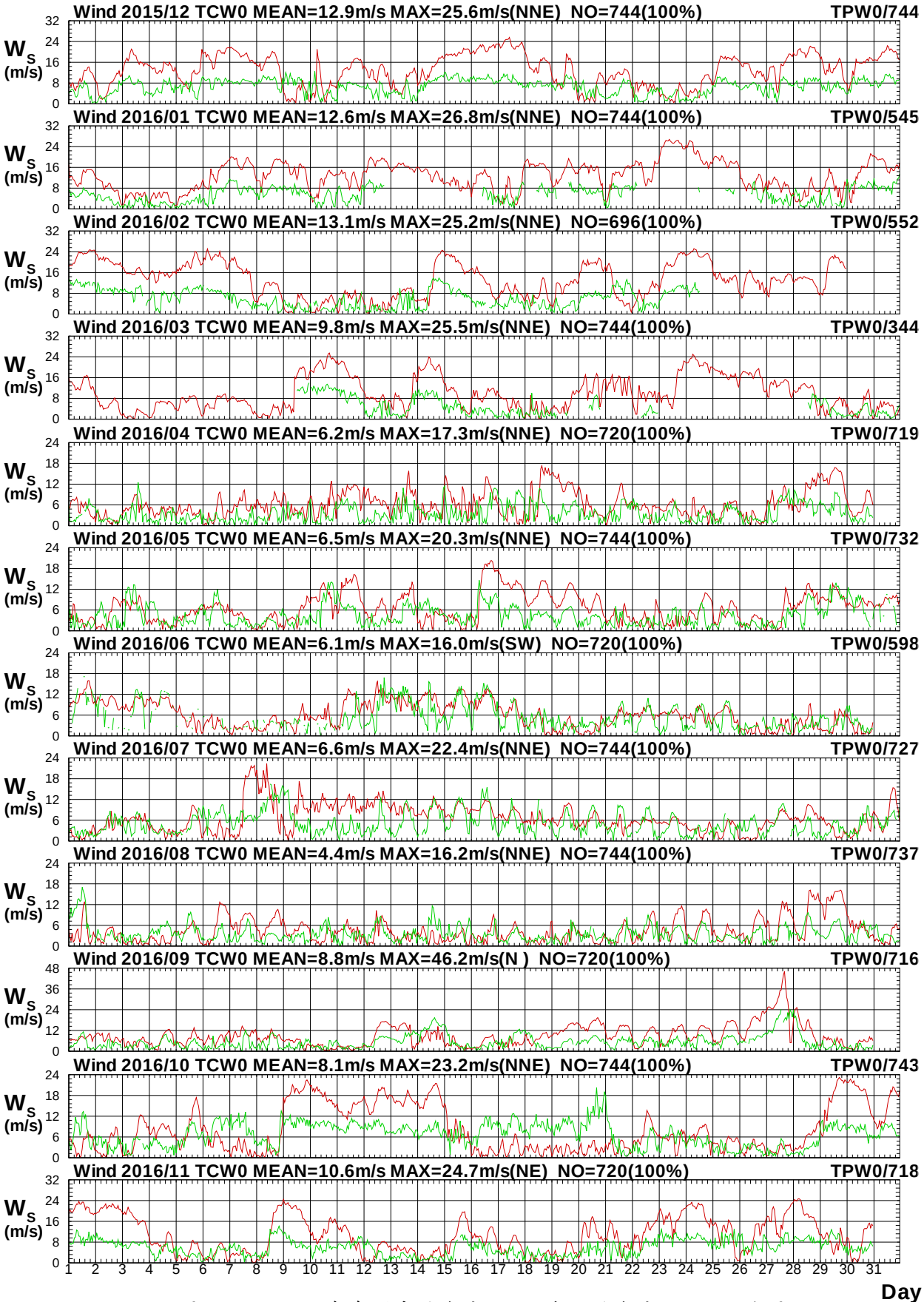

圖 1.17a　2016年每月中雲海域 W 站與北苗海域 W 站風速圖

W15CTCW0.1HA W15CTPW0.1H0 W161TCW0.1HA W161TPW0.1H0 W162TCW0.1HA W162TPW0.1H0
W163TCW0.1HA W163TPW0.1H0 W164TCW0.1HA W164TPW0.1H0 W165TCW0.1HA W165TPW0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

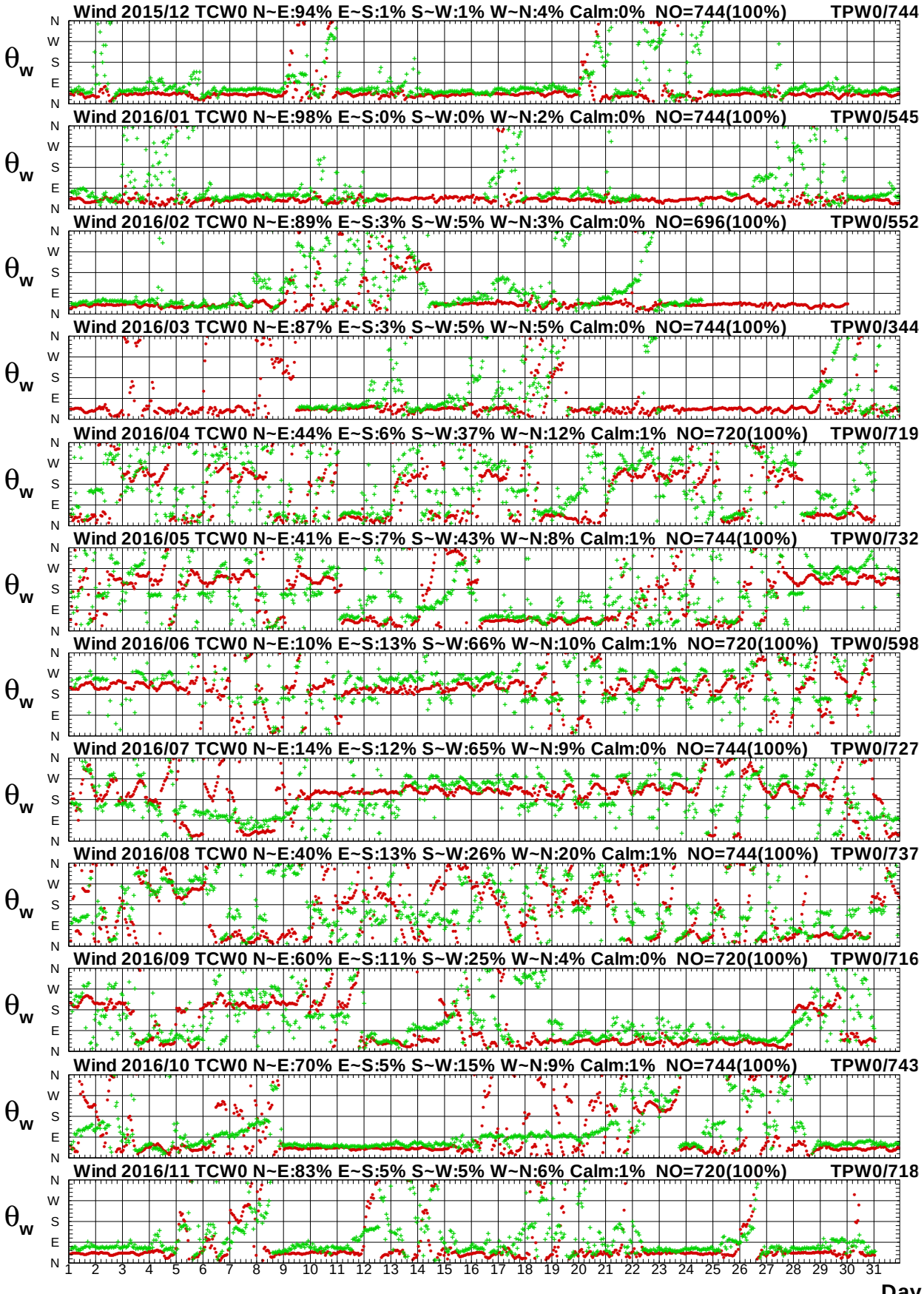

圖1.17b　2016年每月中雲海域 W 站與北苗海域 W 站風向圖

W15CTCW0.1HA W15CTPW0.1H0 W161TCW0.1HA W161TPW0.1H0 W162TCW0.1HA W162TPW0.1H0
W163TCW0.1HA W163TPW0.1H0 W164TCW0.1HA W164TPW0.1H0 W165TCW0.1HA W165TPW0.1H0

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Wind Speed in Chung-Yun Seas of TCW0 at 2016

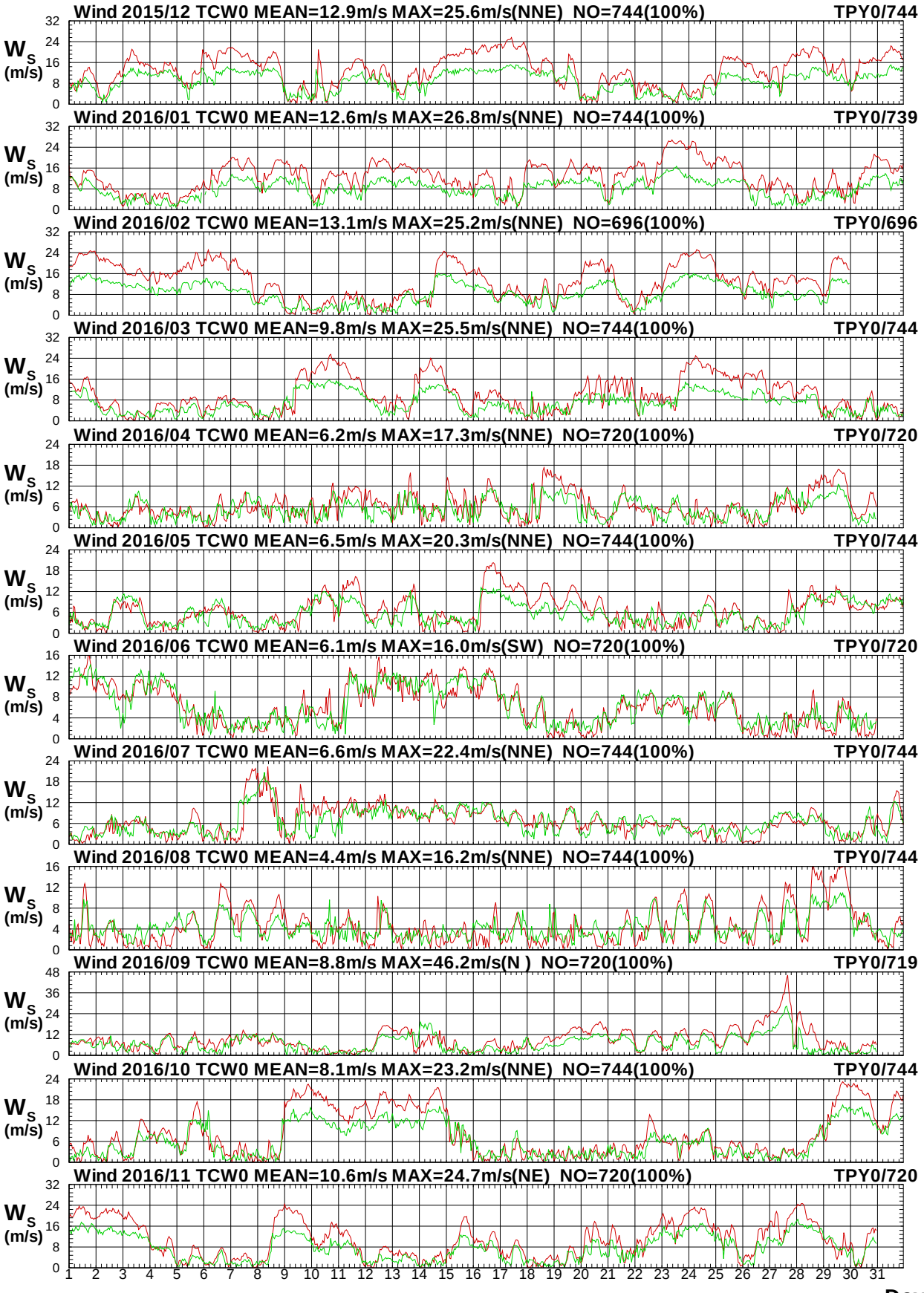

圖1.18a　2016年每月中雲海域 W 站與北苗海域 Y 站風速圖

W15CTCW0.1HA W15CTPY0.1H0 W161TCW0.1HA W161TPY0.1H0 W162TCW0.1HA W162TPY0.1H0
W163TCW0.1HA W163TPY0.1H0 W164TCW0.1HA W164TPY0.1H0 W165TCW0.1HA W165TPY0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

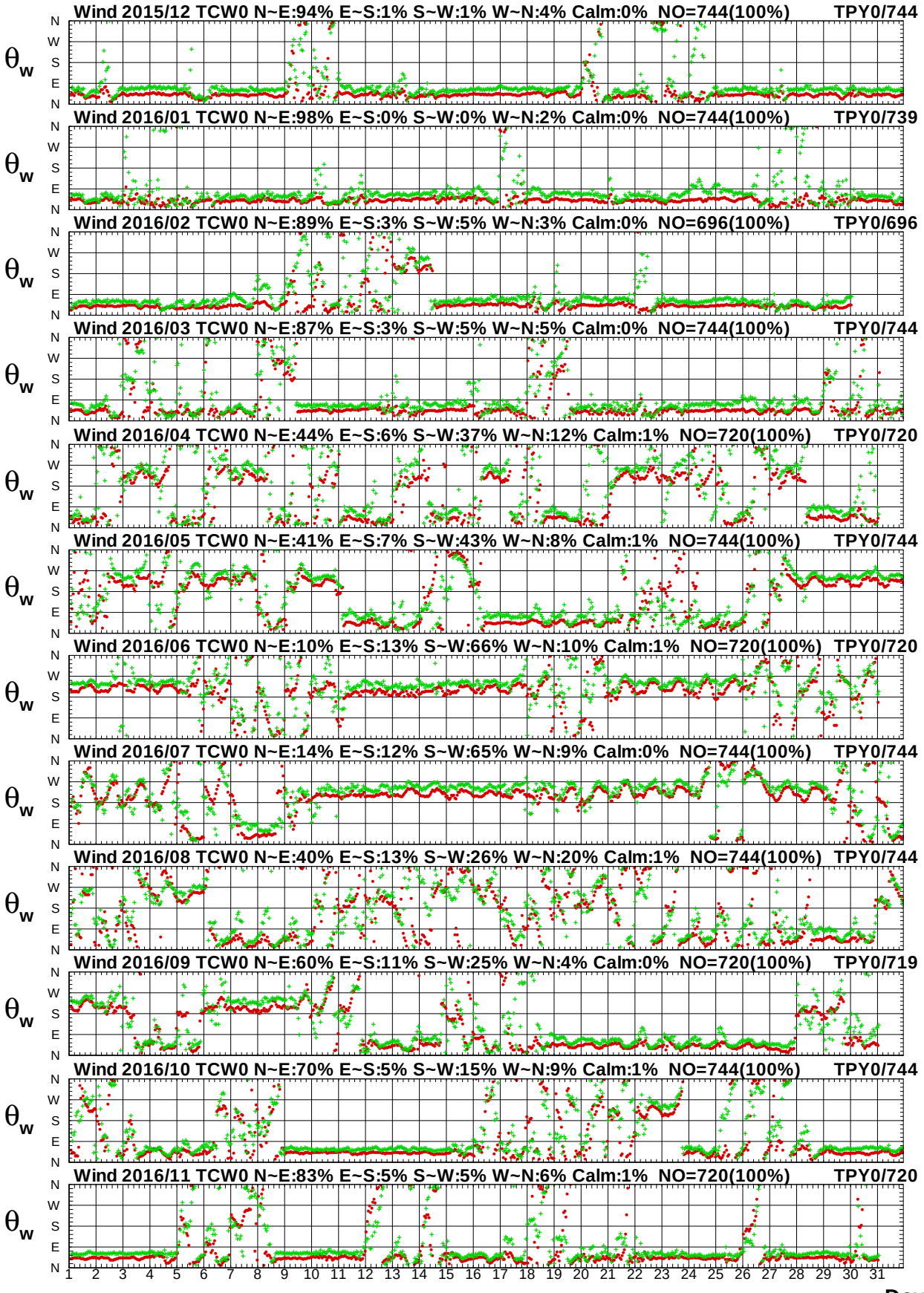

圖1.18b　2016年每月中雲海域 W 站與北苗海域 Y 站風向圖

W15CTCW0.1HA W15CTPY0.1H0 W161TCW0.1HA W161TPY0.1H0 W162TCW0.1HA W162TPY0.1H0
W163TCW0.1HA W163TPY0.1H0 W164TCW0.1HA W164TPY0.1H0 W165TCW0.1HA W165TPY0.1H0

Institute of Harbor & Marine Technology

Wind Speed in Chung-Yun Seas of TCW0 at 2016

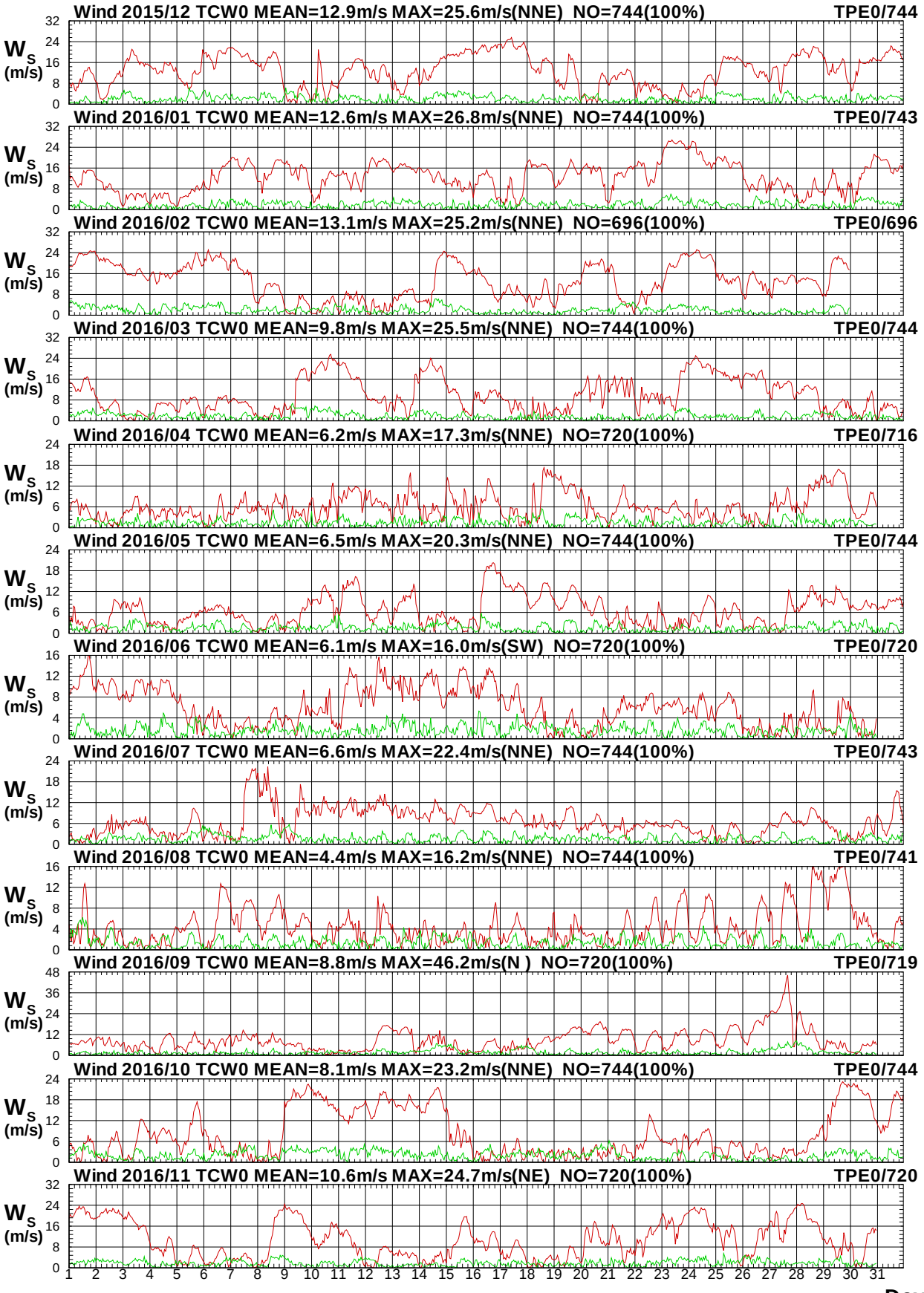

圖1.19a　2016年每月中雲海域 W 站與北苗海域 E 站風速圖

W15CTCW0.1HA W15CTPE0.1H0 W161TCW0.1HA W161TPE0.1H0 W162TCW0.1HA W162TPE0.1H0
W163TCW0.1HA W163TPE0.1H0 W164TCW0.1HA W164TPE0.1H0 W165TCW0.1HA W165TPE0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

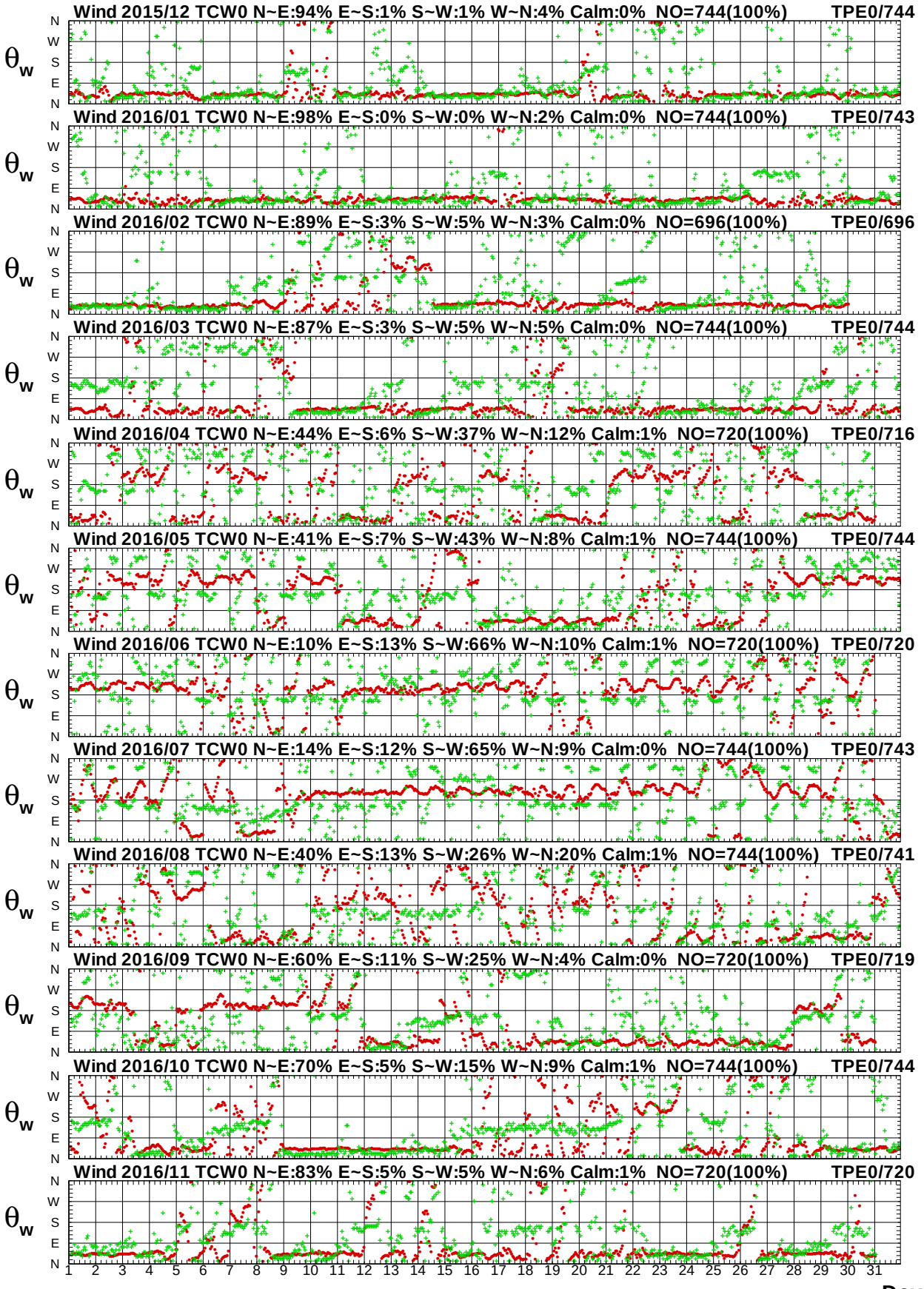

圖1.19b　2016年每月中雲海域 W 站與北苗海域 E 站風向圖

Wind Speed in Chung-Yun Seas of TCW0 at 2016

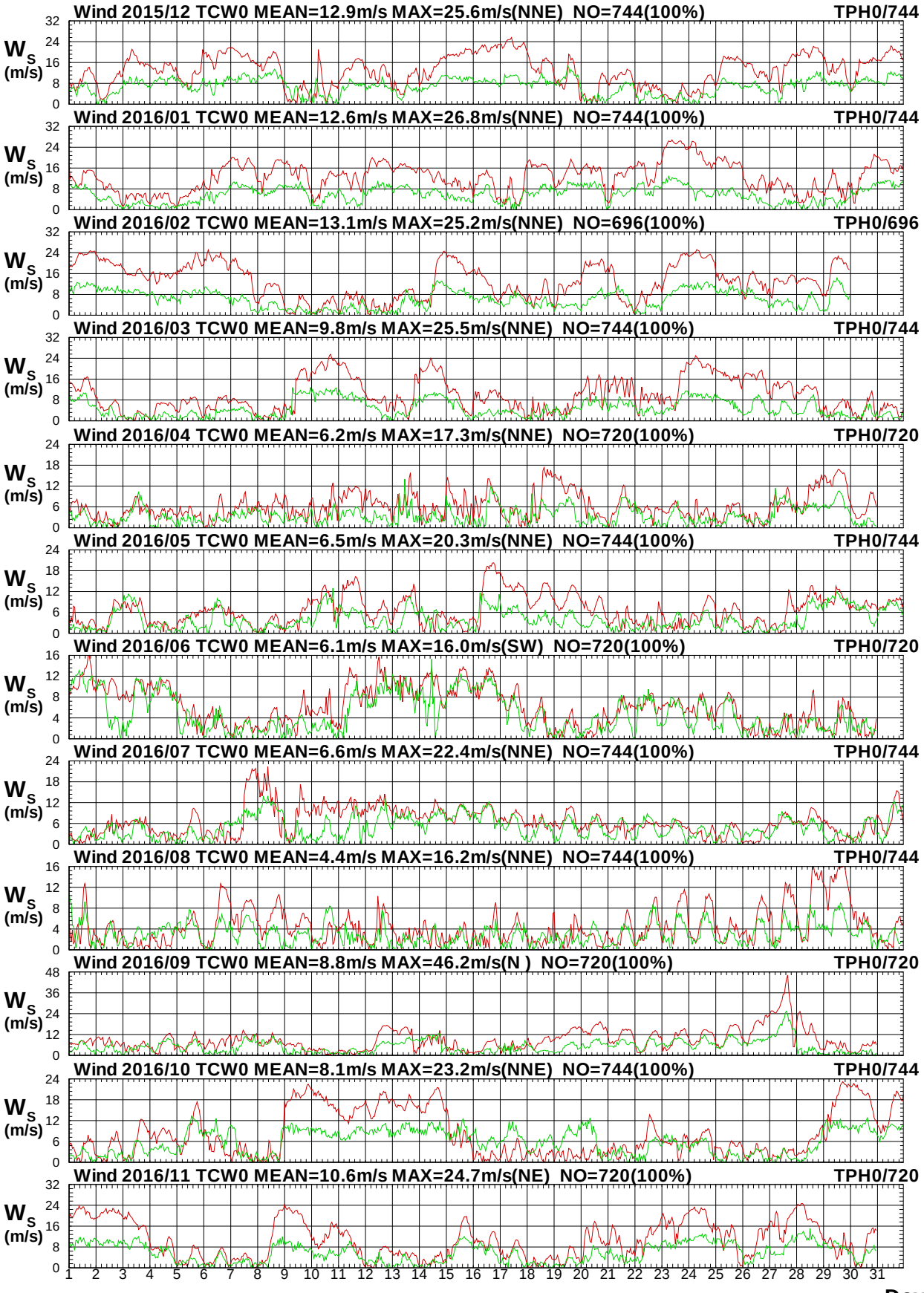

圖1.20a　2016年每月中雲海域 W 站與北苗海域 H 站風速圖

W15CTCW0.1HA W15CTPH0.1H0 W161TCW0.1HA W161TPH0.1H0 W162TCW0.1HA W162TPH0.1H0
W163TCW0.1HA W163TPH0.1H0 W164TCW0.1HA W164TPH0.1H0 W165TCW0.1HA W165TPH0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

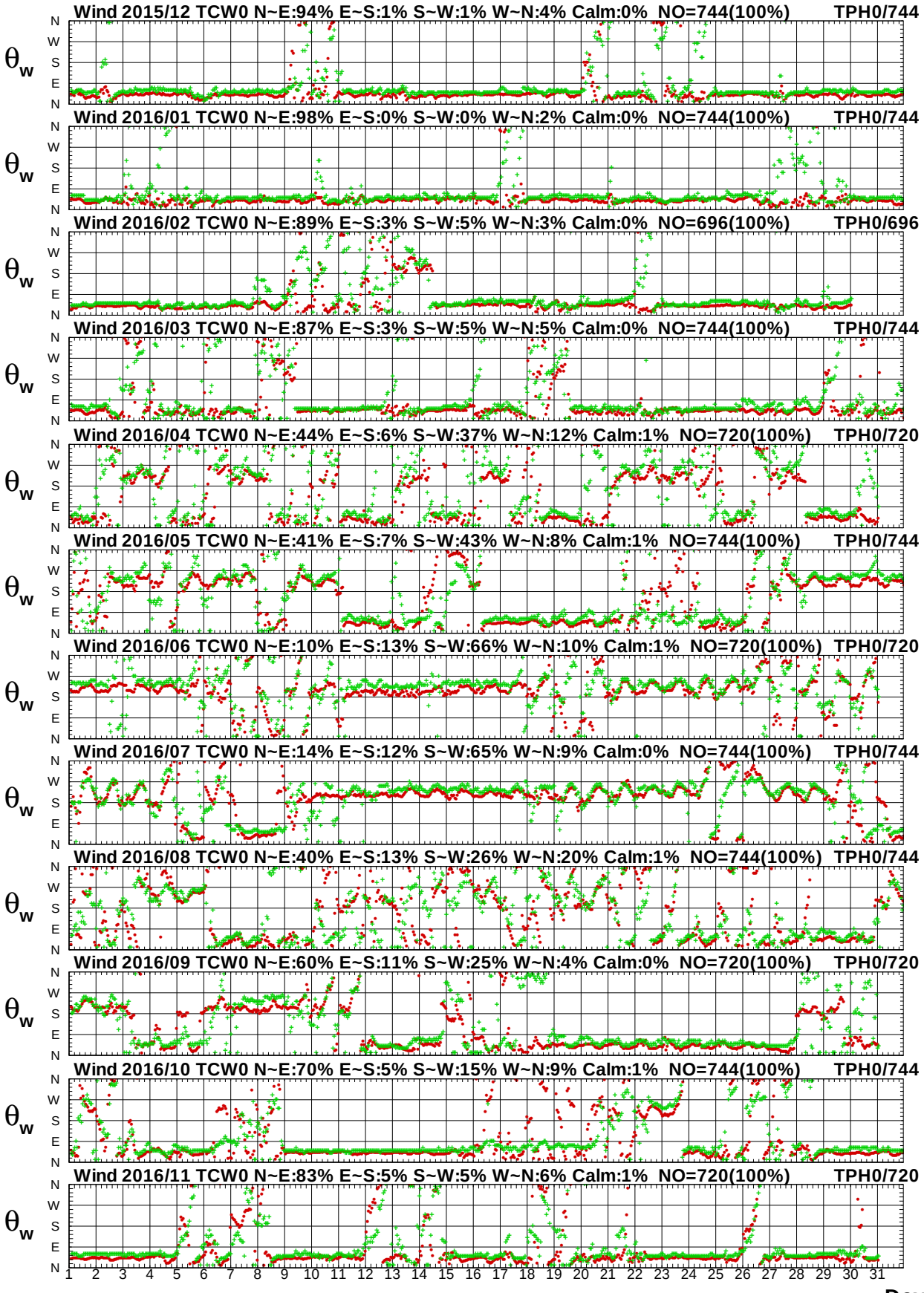

圖1.20b　2016年每月中雲海域 W 站與北苗海域 H 站風向圖

W15CTCW0.1HA W15CTPH0.1H0 W161TCW0.1HA W161TPH0.1H0 W162TCW0.1HA W162TPH0.1H0
W163TCW0.1HA W163TPH0.1H0 W164TCW0.1HA W164TPH0.1H0 W165TCW0.1HA W165TPH0.1H0

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Wind Speed in Chung-Yun Seas of TCW0 at 2016

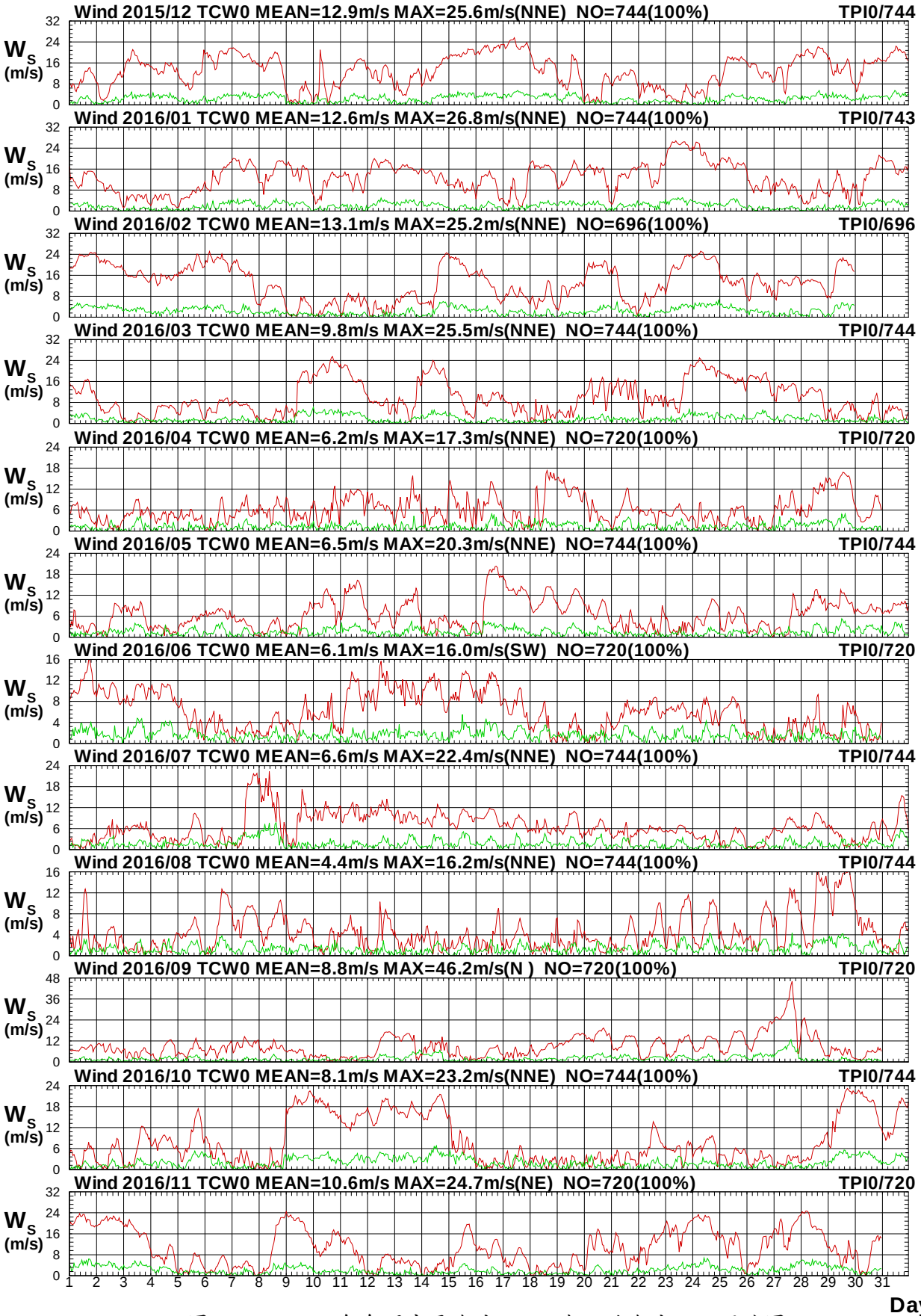

圖 1.21a　2016年每月中雲海域 W 站與北苗海域 I 站風速圖

W15CTCW0.1HA W15CTPI0.1H0 W161TCW0.1HA W161TPI0.1H0 W162TCW0.1HA W162TPI0.1H0
W163TCW0.1HA W163TPI0.1H0 W164TCW0.1HA W164TPI0.1H0 W165TCW0.1HA W165TPI0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

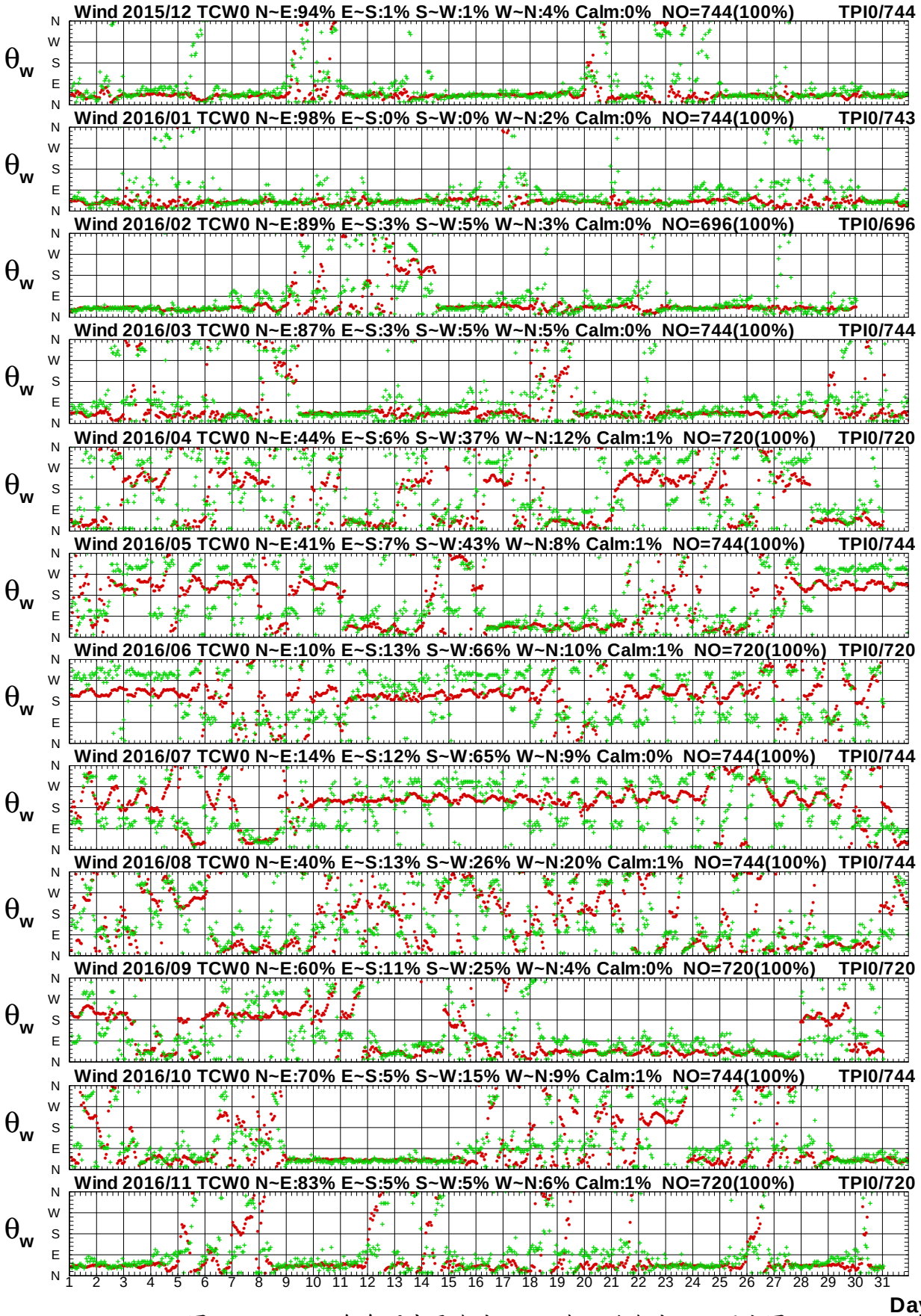

圖 1.21b　2016年每月中雲海域 W 站與北苗海域 I 站風向圖

W15CTCW0.1HA W15CTPI0.1H0 W161TCW0.1HA W161TPI0.1H0 W162TCW0.1HA W162TPI0.1H0
W163TCW0.1HA W163TPI0.1H0 W164TCW0.1HA W164TPI0.1H0 W165TCW0.1HA W165TPI0.1H0

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Wind Speed in Chung-Yun Seas of TCW0 at 2016

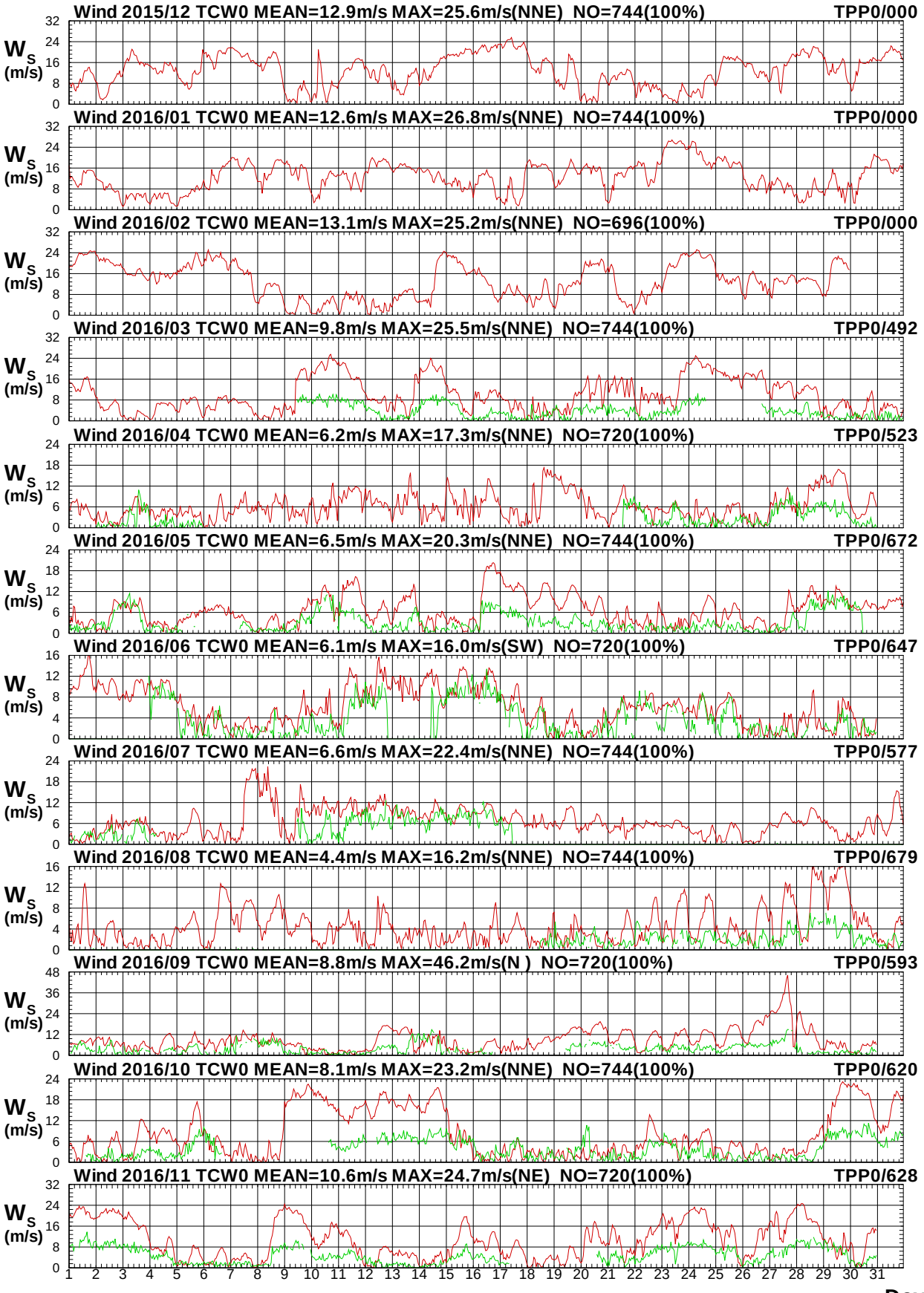

圖1.22a　2016年每月中雲海域 W 站與北苗海域 P 站風速圖

W15CTCW0.1HA W15CTPP0.1H0 W161TCW0.1HA W161TPP0.1H0 W162TCW0.1HA W162TPP0.1H0
W163TCW0.1HA W163TPP0.1H0 W164TCW0.1HA W164TPP0.1H0 W165TCW0.1HA W165TPP0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

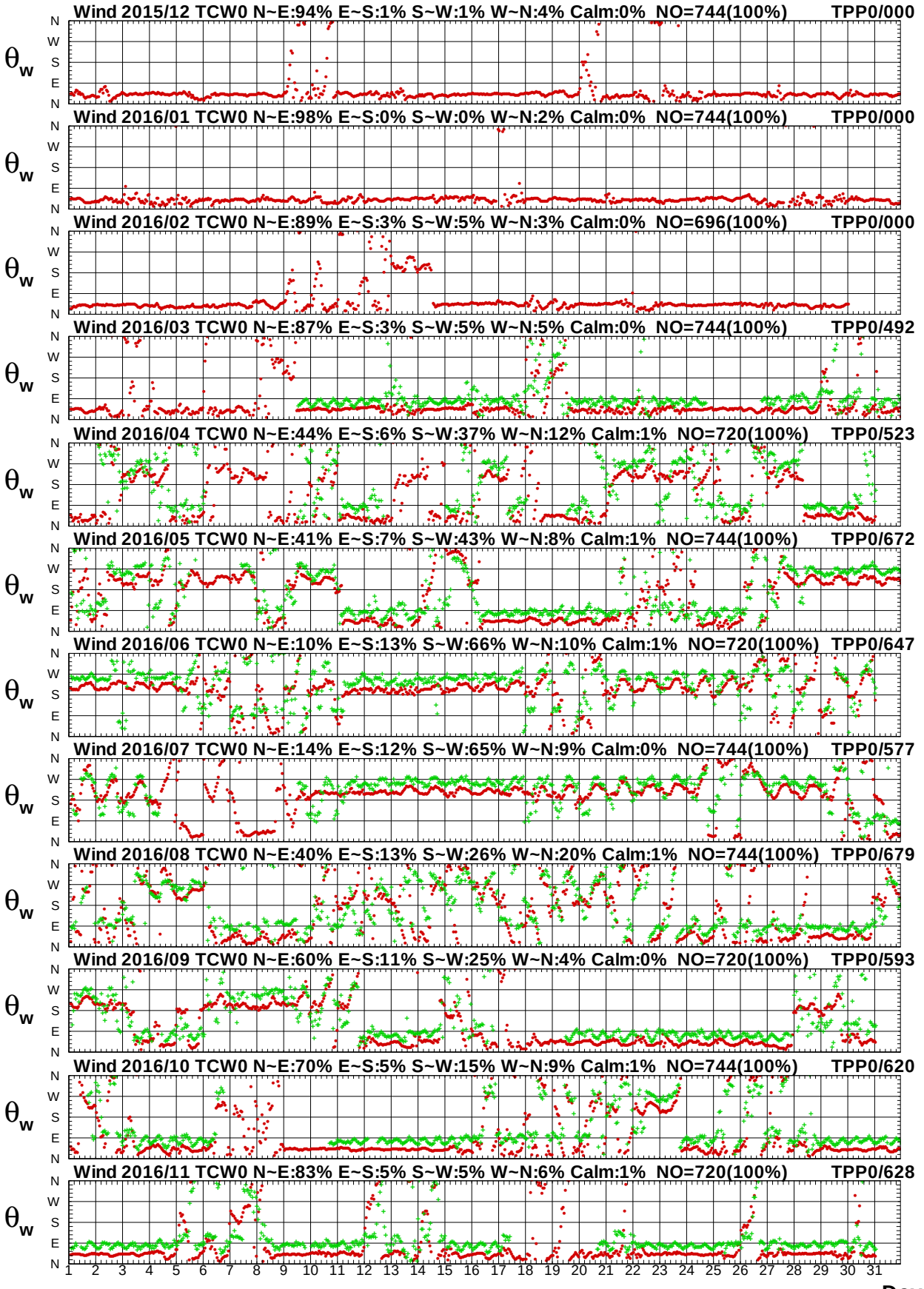

圖1.22b　2016年每月中雲海域 W 站與北苗海域 P 站風向圖

W15CTCW0.1HA W15CTPP0.1H0 W161TCW0.1HA W161TPP0.1H0 W162TCW0.1HA W162TPP0.1H0
W163TCW0.1HA W163TPP0.1H0 W164TCW0.1HA W164TPP0.1H0 W165TCW0.1HA W165TPP0.1H0

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Wind Speed in Chung-Yun Seas of TCW0 at 2016

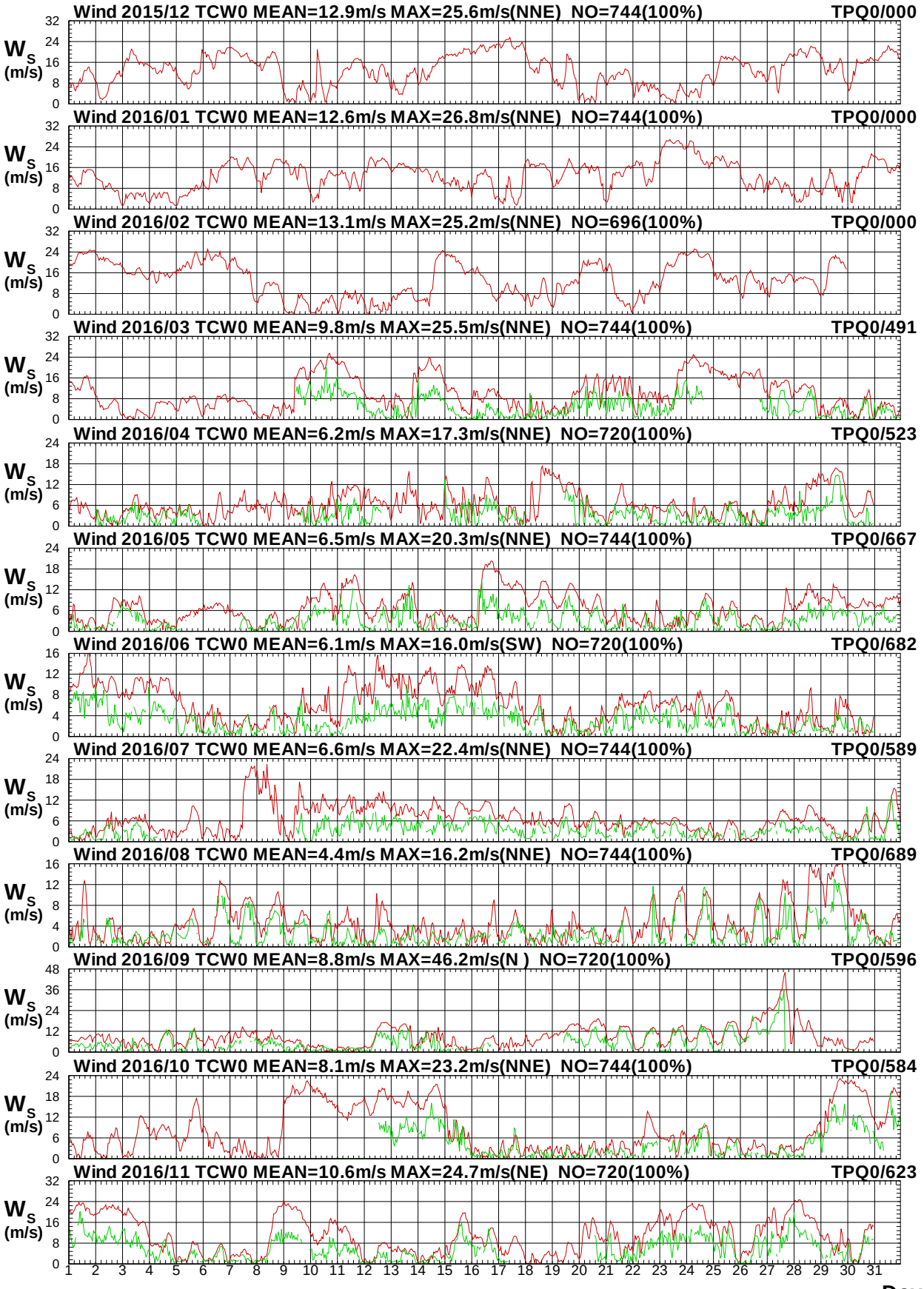

圖1.23a　2016年每月中雲海域 W 站與北苗海域 Q 站風速圖

W15CTCW0.1HA W15CTPQ0.1H0 W161TCW0.1HA W161TPQ0.1H0 W162TCW0.1HA W162TPQ0.1H0
W163TCW0.1HA W163TPQ0.1H0 W164TCW0.1HA W164TPQ0.1H0 W165TCW0.1HA W165TPQ0.1H0

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Wind Direction in Chung-Yun Seas of TCW0 at 2016

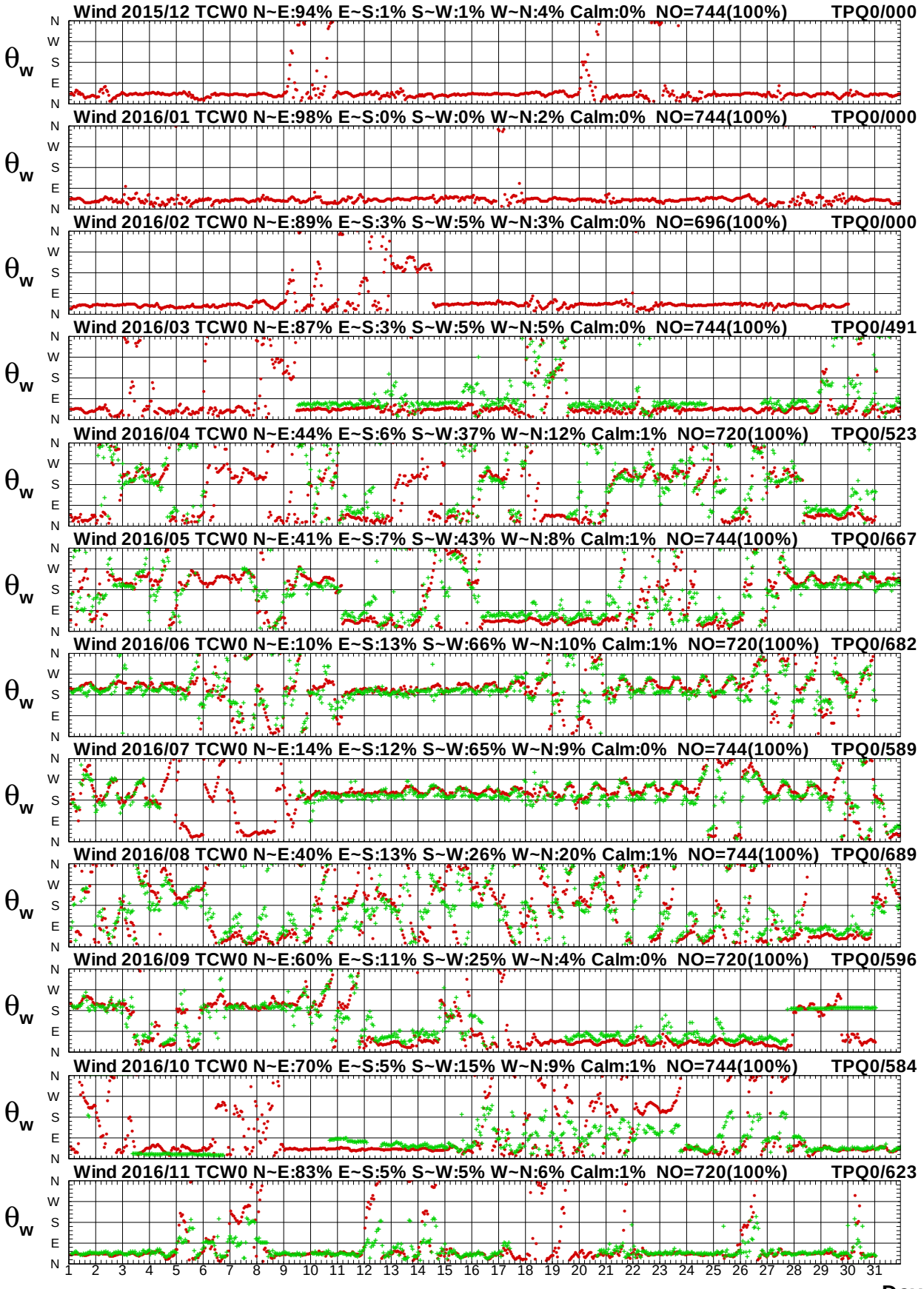

圖 1.23b　2016年每月中雲海域 W 站與北苗海域 Q 站風向圖

第二章　2016 年中雲海域觀測波浪資料

中雲海域(臺中~雲林)波浪之觀測本中心**(IHMT)**係於 1999 年 10 月安置挪威 NORTEK 公司表面波浪監測系統於台中港**測站 X0** 處，位置如附圖 2，2000 年因臺中港務局北防波堤延長工程開始展開整平拋石工作影響到儀器安全，於 8 月 18 日暫時停止量測並將設備收回。2003 年 5 月臺中港務局北防波堤延長工程完成後本所隨即在 2003 年 7 月 5 日就安裝完成(挪威 NORTEK 公司)潮波流監測系統，安裝在臺中港北防波堤堤頭 150 公尺外、水深 25 公尺處(稱**測站 X1**)。

測站 Y(彰濱外海浮標站)之波浪儀屬海科中心**(TORI)**所設置;**測站 Z**(彰濱外海一浮標站)及**測站 R**(彰濱外海二浮標站)之波浪儀屬中興工程所設置。臺中海域各測站歷年觀測波浪資料蒐集概況如表 2。

波浪觀測 AWCP 系統有兩個分離波高量測模式：一個是對平靜波浪時，當資料由傳統式壓力感應器量測時將會因儀器佈放的深度而受很大的影響。此時，表面高度必須用一個聲波式的高度感應器量測波高。AWCP 波向量測範圍：波向的量測從海面下 3 米以上的流向資料與波高資料計算轉換而得。對攪動的海況來說；用於轉換波向的該層深度應該自動被調整為平均水位也就是 $H_{max/2}$。量測的參數為：平均波向及波向分佈，波向單位為度。

本波浪年報以取經檢核或修補後之 **X 站**資料作為**主要觀測站**，2016 年主要觀測站修補前(後)每月觀測之波浪資料記錄期間統計表，如表 2.1a，2016 年波浪**次要觀測站**資料(未補餘)記錄統計表，如表 2.1b，**主要觀測站修補前後**每月波浪歷線比較圖，如圖 2.1，**主要觀測站**與**次要觀測站**(或**其他觀測站**)每月波浪歷線比較圖，如圖 2.2 以後。

表 2 中雲海域觀測波浪資料蒐集概況表(統計時間至 2016 年 11 月)

測站	緯度	經度	觀測期間	觀測單位	備註
X0	24°17'54"N	120°29'39"E	1999/10-2000/08	港研中心	北堤外海(延伸前)
X1	24°18'02"N	120°29'05"E	2003/07-2016/11(觀測中)	港研中心	北堤外海
Y	24°01'12"N	120°13'59"E	2012/07-2013/08	海科中心	彰濱外海浮標站
Z	24°06'24"	119°41'33"	2016/09-2016/11(觀測中)	中興工程	彰化外海一浮標
R	24°06'56"	119°51'08"	2016/09-2016/11(觀測中)	中興工程	彰化外海二浮標

圖 2 中雲海域波浪觀測站位置示意圖

表2.1a 2016年每月中雲海域修補前各測站觀測波浪資料紀錄統計表

年/月 港區	中雲海域	中雲海域	中雲海域	中雲海域	中雲海域	中雲海域	中雲海域	中雲海域
測站	X	Y	Z	R				
2015/12月	701 (94.2%)	572 (76.9%)	*	*	*	*	*	*
2016/ 1月	734 (98.7%)	417 (56.0%)	*	*	*	*	*	*
2016/ 2月	692 (99.4%)	19 (2.7%)	*	*	*	*	*	*
2016/ 3月	737 (99.1%)	349 (46.9%)	*	*	*	*	*	*
2016/ 4月	718 (99.7%)	699 (97.1%)	*	*	*	*	*	*
2016/ 5月	723 (97.2%)	701 (94.2%)	*	*	*	*	*	*
2016/ 6月	714 (99.2%)	170 (23.6%)	*	*	*	*	*	*
2016/ 7月	710 (95.4%)	475 (63.8%)	*	*	*	*	*	*
2016/ 8月	708 (95.2%)	739 (99.3%)	*	*	*	*	*	*
2016/ 9月	628 (87.2%)	707 (98.2%)	490 (68.1%)	488 (67.8%)	*	*	*	*
2016/10月	*	680 (91.4%)	667 (89.7%)	669 (89.9%)	*	*	*	*
2016/11月	*	619 (86.0%)	621 (86.3%)	610 (84.7%)	*	*	*	*
2016/冬季	*	*	*	*	*	*	*	*
2016/春季	*	*	*	*	*	*	*	*
2016/夏季	*	*	*	*	*	*	*	*
2016/秋季	*	*	*	*	*	*	*	*
2016/整年	*	*	*	*	*	*	*	*
起始年月	*	*	*	*	*	*	*	*
結束年月	*	*	*	*	*	*	*	*

表2.1b 2016年每月中雲海域修補後各測站波浪資料統計表

年/月 港區	中雲海域	中雲海域	中雲海域	中雲海域	中雲海域	中雲海域	中雲海域	中雲海域
測站	X	Y	Z	R				
2015/12月	744 (100%)	*	*	*	*	*	*	*
2016/ 1月	744 (100%)	*	*	*	*	*	*	*
2016/ 2月	696 (100%)	*	*	*	*	*	*	*
2016/ 3月	744 (100%)	*	*	*	*	*	*	*
2016/ 4月	720 (100%)	*	*	*	*	*	*	*
2016/ 5月	744 (100%)	*	*	*	*	*	*	*
2016/ 6月	720 (100%)	*	*	*	*	*	*	*
2016/ 7月	744 (100%)	*	*	*	*	*	*	*
2016/ 8月	744 (100%)	*	*	*	*	*	*	*
2016/ 9月	720 (100%)	*	*	*	*	*	*	*
2016/10月	744 (100%)	*	*	*	*	*	*	*
2016/11月	720 (100%)	*	*	*	*	*	*	*
2016/冬季	*	*	*	*	*	*	*	*
2016/春季	*	*	*	*	*	*	*	*
2016/夏季	*	*	*	*	*	*	*	*
2016/秋季	*	*	*	*	*	*	*	*
2016/整年	*	*	*	*	*	*	*	*
起始年月	*	*	*	*	*	*	*	*
結束年月	*	*	*	*	*	*	*	*

Wave H_s in Chung-Yun Seas of TCX0 at 2016

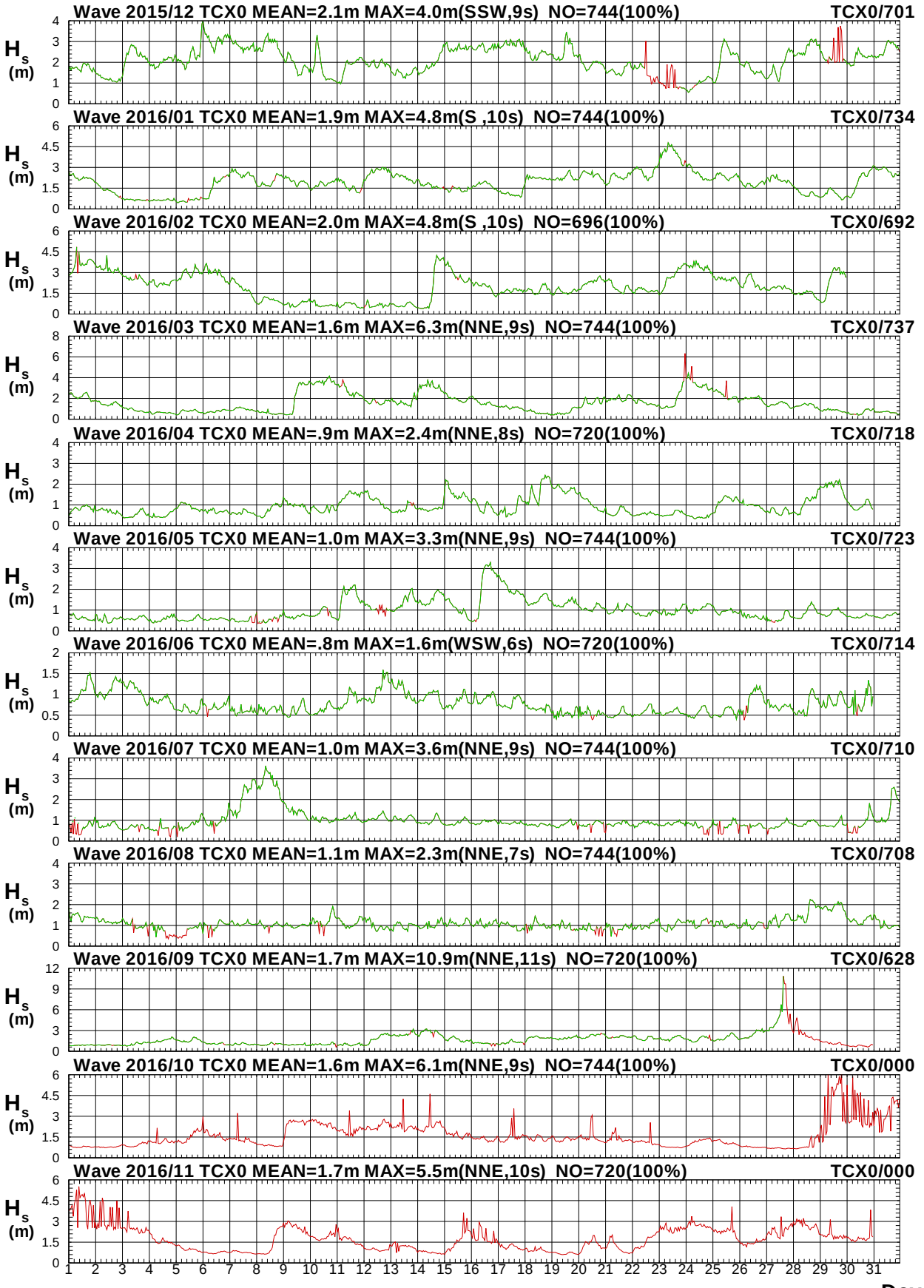

圖 2.1a　2016年每月中雲海域 X 站修補前後之波高比較圖

V15CTCX0.1HA V15CTCX0.1H0 V161TCX0.1HA V161TCX0.1H0 V162TCX0.1HA V162TCX0.1H0
V163TCX0.1HA V163TCX0.1H0 V164TCX0.1HA V164TCX0.1H0 V165TCX0.1HA V165TCX0.1H0

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Wave T_p in Chung-Yun Seas of TCX0 at 2016

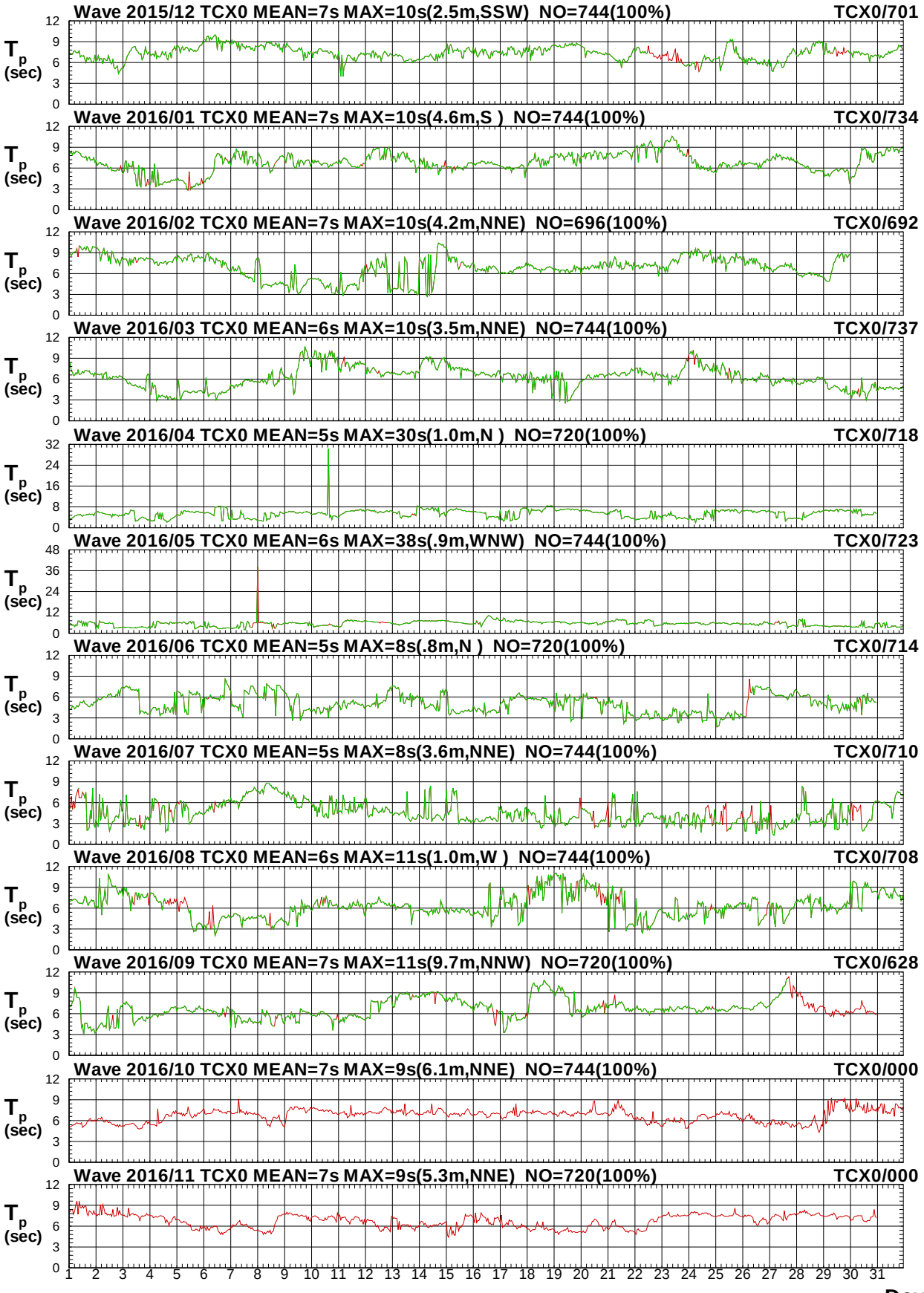

圖 2.1b　2016年每月中雲海域 X 站修補前後之週期比較圖

Wave Direction in Chung-Yun Seas of TCX0 at 2016

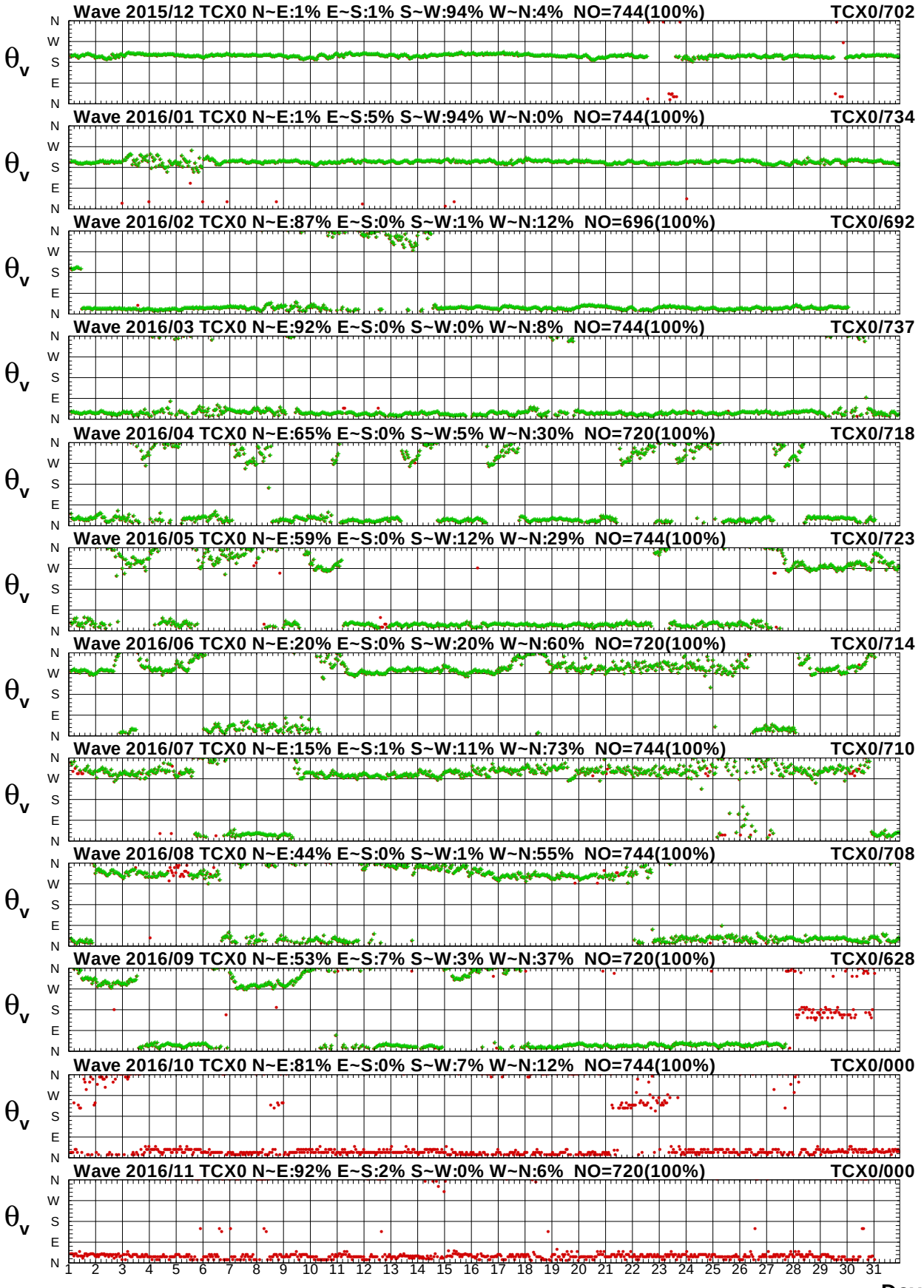

圖2.1c　2016年每月中雲海域 X 站修補前後之波向比較圖

V15CTCX0.1HA V15CTCX0.1H0 V161TCX0.1HA V161TCX0.1H0 V162TCX0.1HA V162TCX0.1H0
V163TCX0.1HA V163TCX0.1H0 V164TCX0.1HA V164TCX0.1H0 V165TCX0.1HA V165TCX0.1H0

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Wave H_s in Chung-Yun Seas of TCX0 at 2016

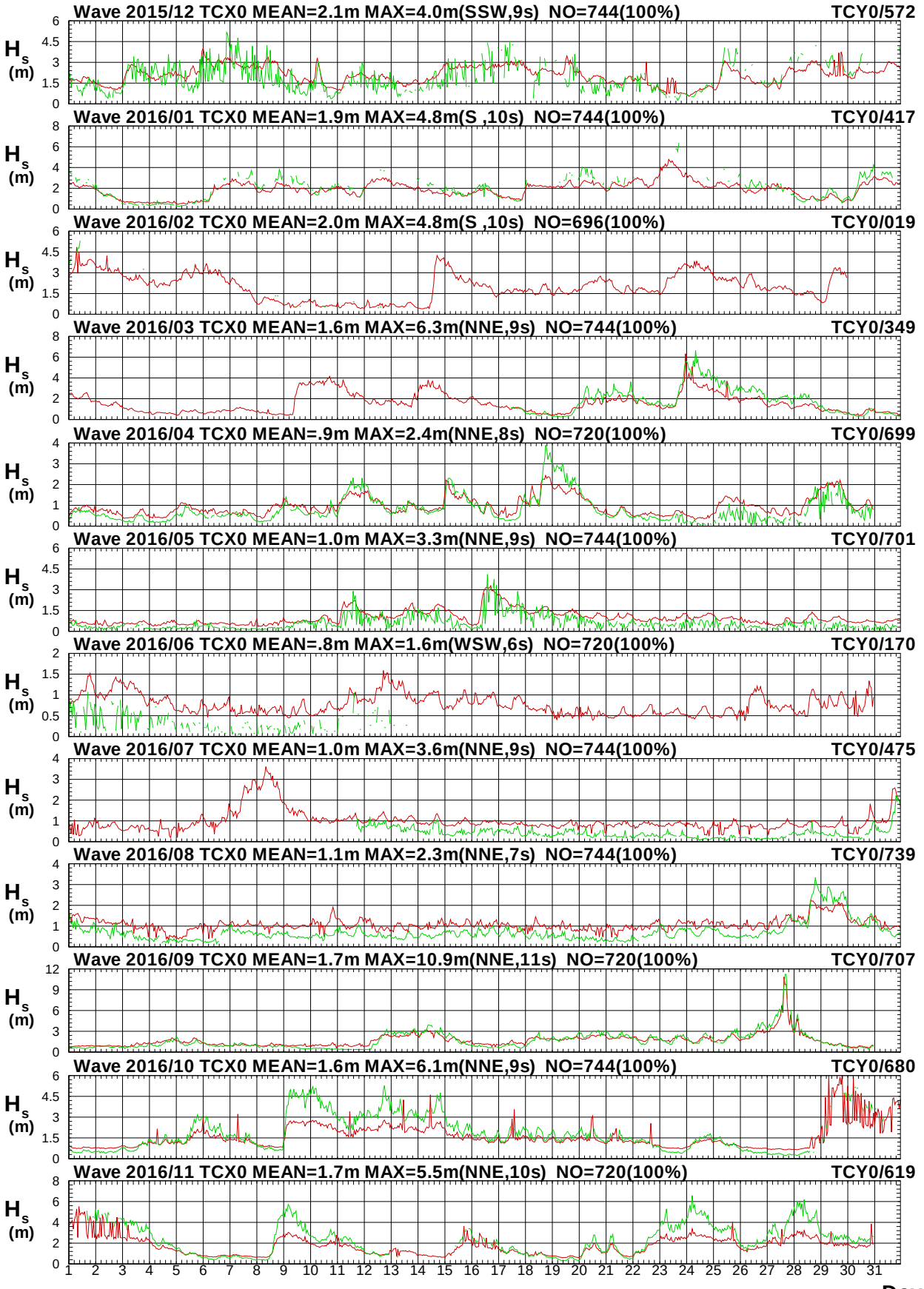

圖 2.2a　2016年每月中雲海域 X 站與 Y 站波高比較圖

V15CTCX0.1HA V15CTCY0.1H0 V161TCX0.1HA V161TCY0.1H0 V162TCX0.1HA V162TCY0.1H0
V163TCX0.1HA V163TCY0.1H0 V164TCX0.1HA V164TCY0.1H0 V165TCX0.1HA V165TCY0.1H0

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Wave T_p in Chung-Yun Seas of TCX0 at 2016

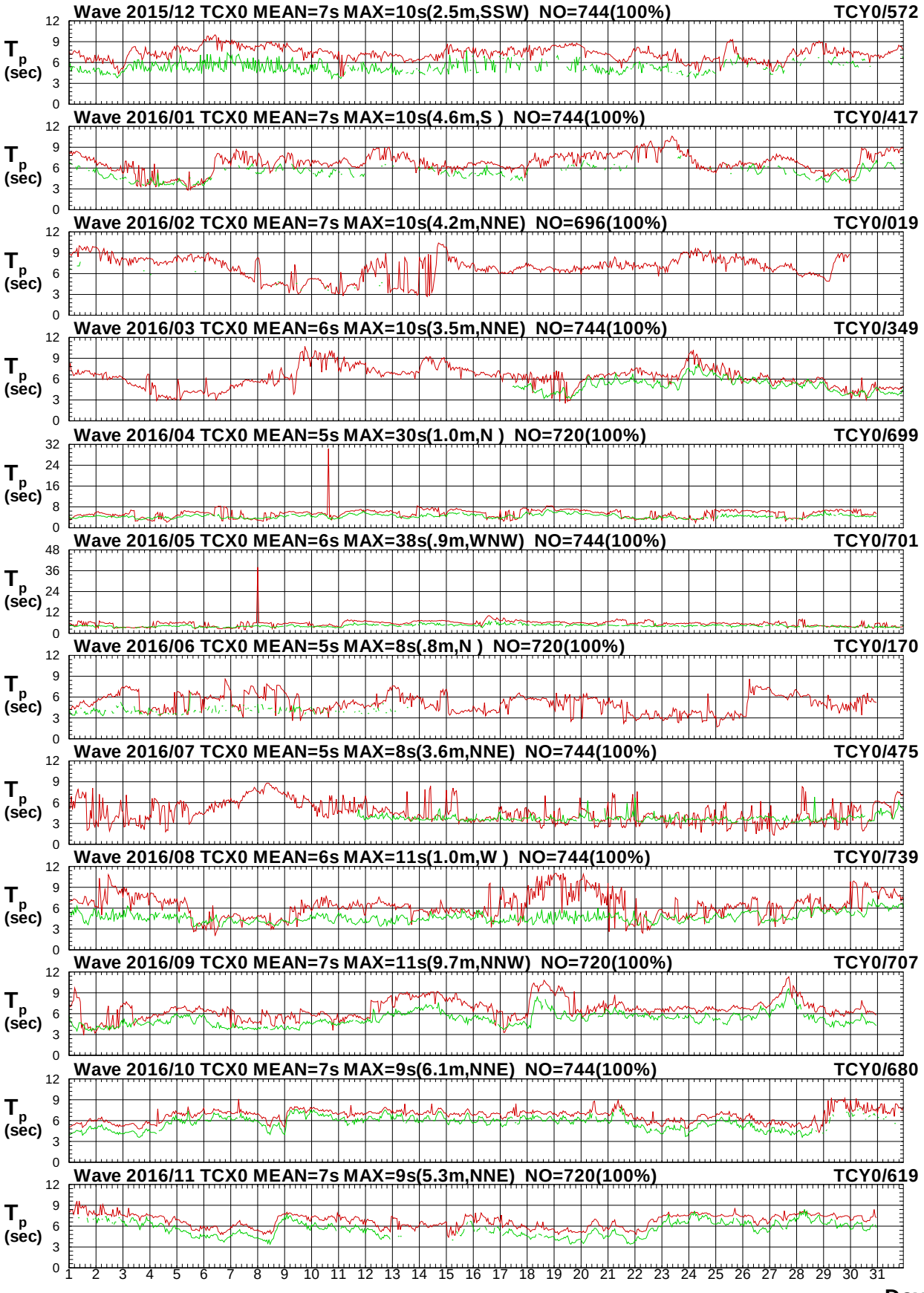

圖 2.2b　2016年每月中雲海域 X 站與 Y 站週期比較圖

V15CTCX0.1HA V15CTCY0.1H0 V161TCX0.1HA V161TCY0.1H0 V162TCX0.1HA V162TCY0.1H0
V163TCX0.1HA V163TCY0.1H0 V164TCX0.1HA V164TCY0.1H0 V165TCX0.1HA V165TCY0.1H0

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Wave Direction in Chung-Yun Seas of TCX0 at 2016

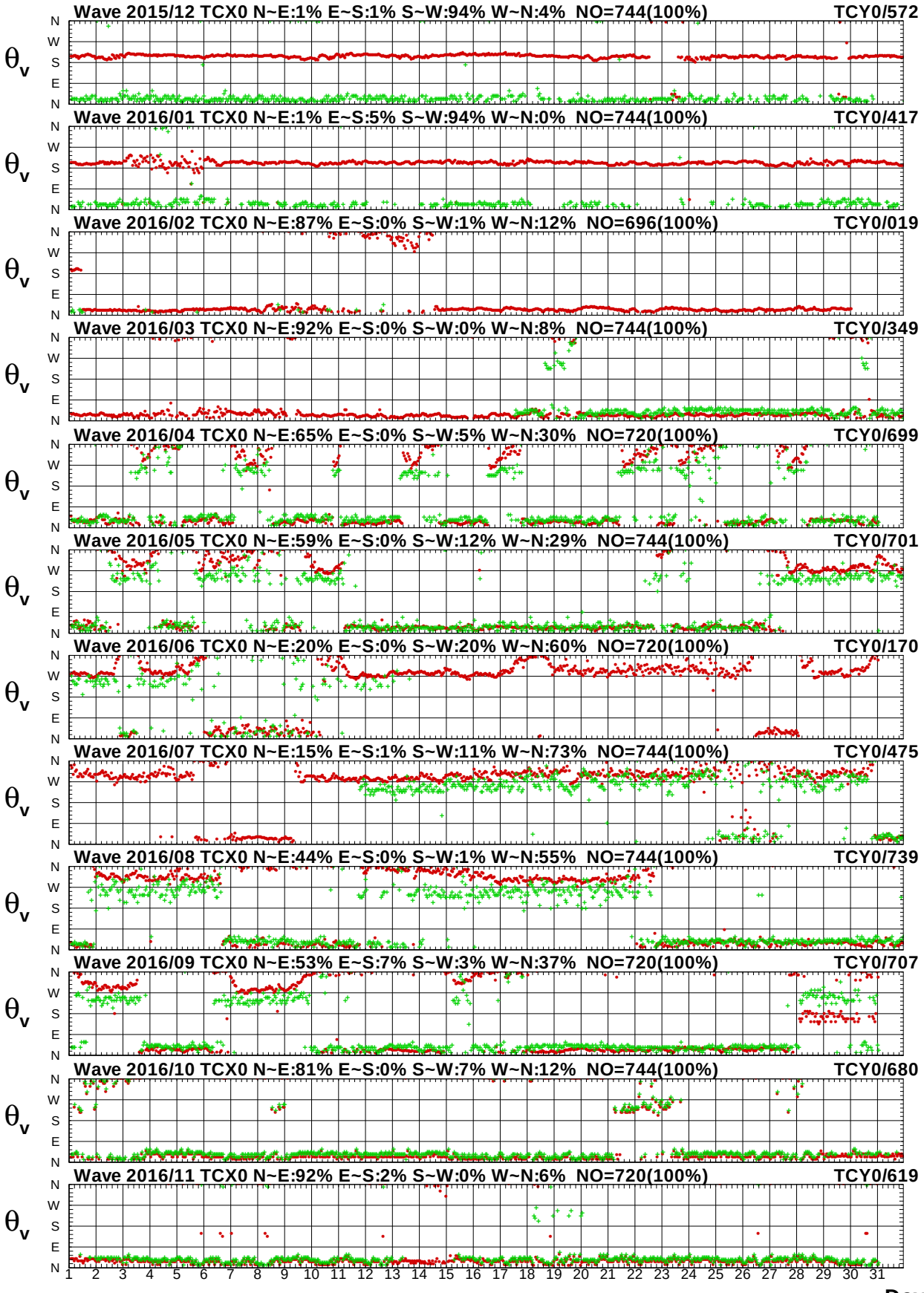

圖 2.2c　2016年每月中雲海域 X 站與 Y 站波向比較圖

V15CTCX0.1HA V15CTCY0.1H0 V161TCX0.1HA V161TCY0.1H0 V162TCX0.1HA V162TCY0.1H0
V163TCX0.1HA V163TCY0.1H0 V164TCX0.1HA V164TCY0.1H0 V165TCX0.1HA V165TCY0.1H0

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Wave H_s in Chung-Yun Seas of TCX0 at 2016

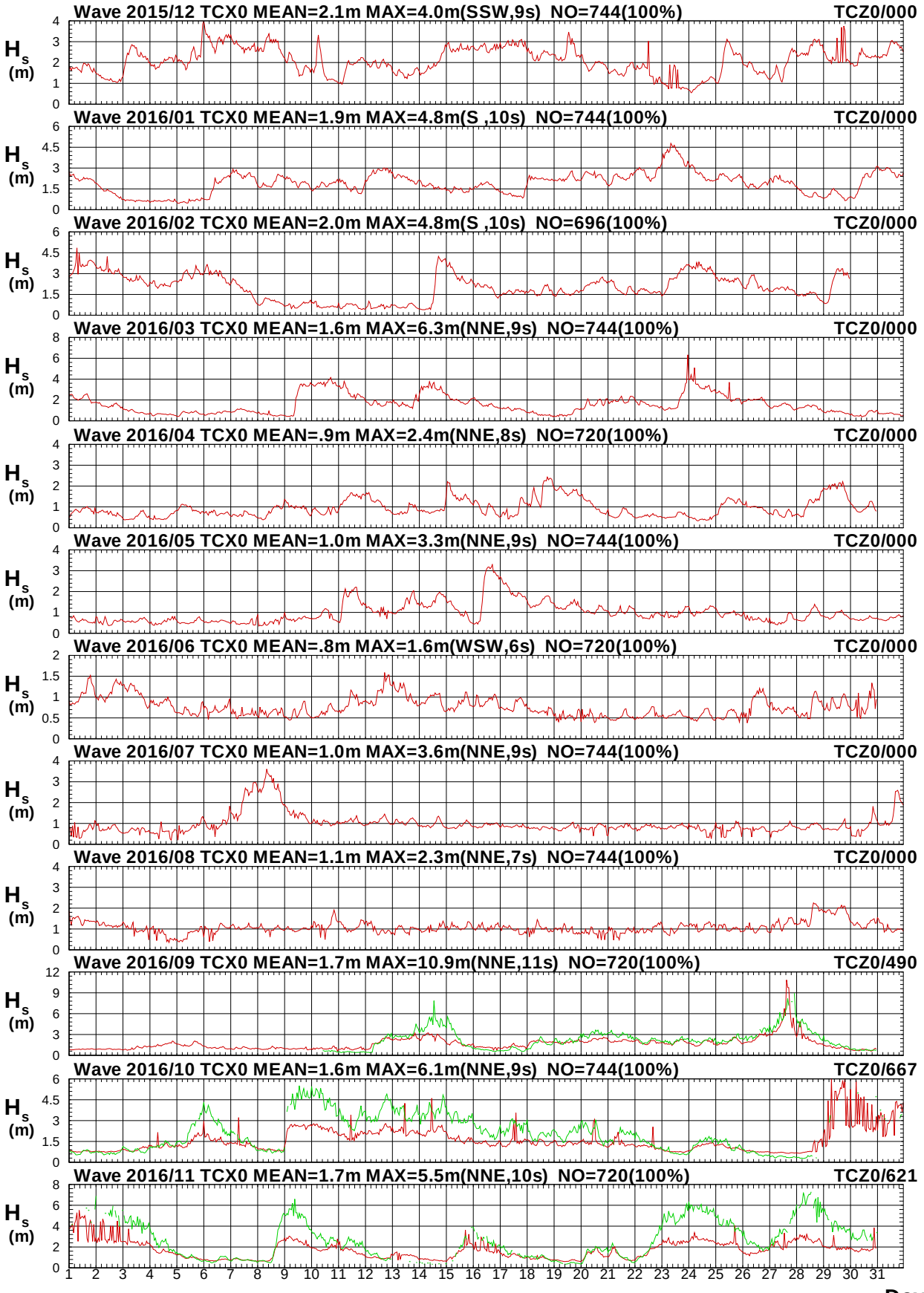

圖 2.3a　2016年每月中雲海域 X 站與 Z 站波高比較圖

V15CTCX0.1HA V15CTCZ0.1H0 V161TCX0.1HA V161TCZ0.1H0 V162TCX0.1HA V162TCZ0.1H0
V163TCX0.1HA V163TCZ0.1H0 V164TCX0.1HA V164TCZ0.1H0 V165TCX0.1HA V165TCZ0.1H0

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Wave T_p in Chung-Yun Seas of TCX0 at 2016

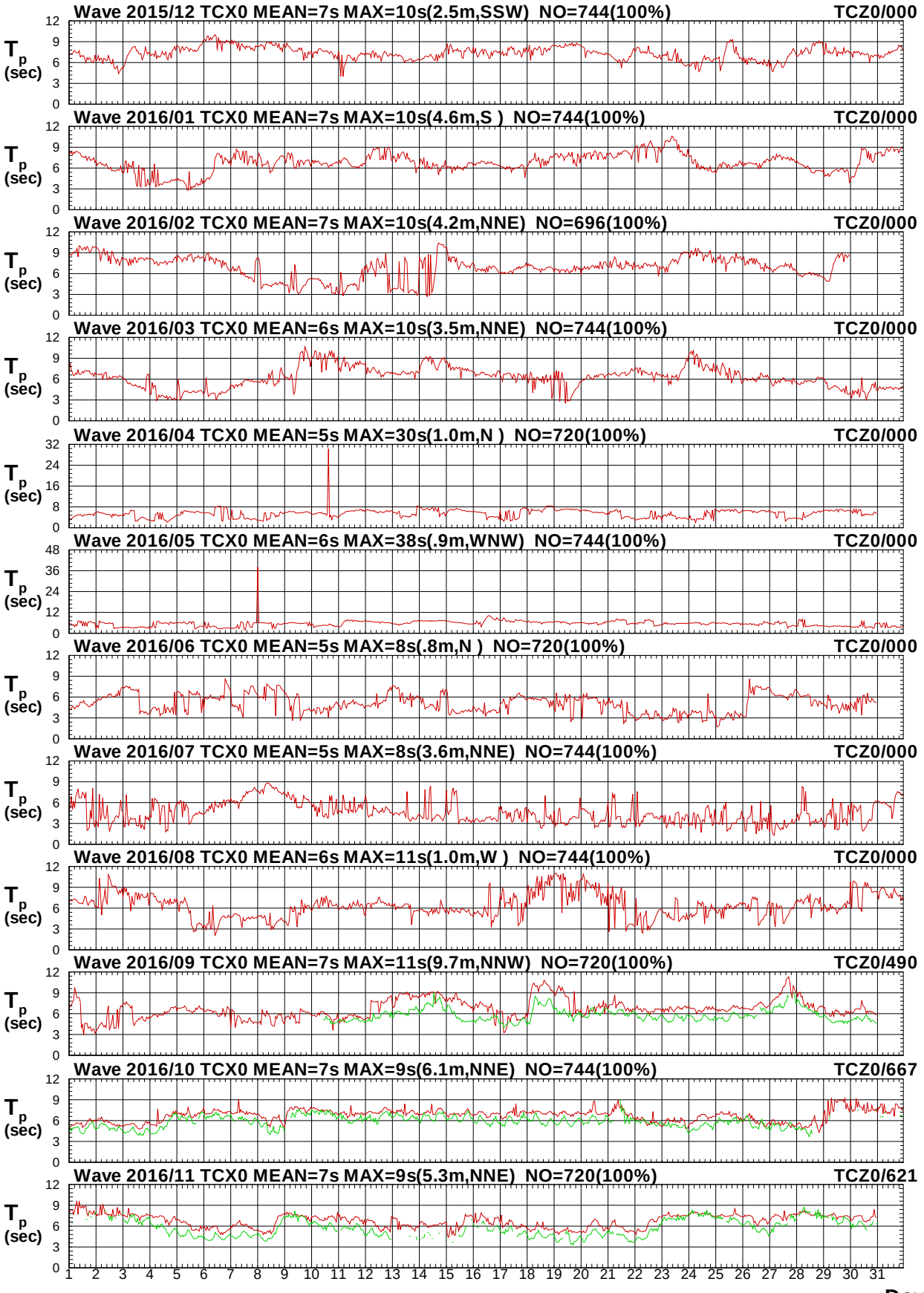

圖 2.3b　2016年每月中雲海域 X 站與 Z 站週期比較圖

V15CTCX0.1HA V15CTCZ0.1H0 V161TCX0.1HA V161TCZ0.1H0 V162TCX0.1HA V162TCZ0.1H0
V163TCX0.1HA V163TCZ0.1H0 V164TCX0.1HA V164TCZ0.1H0 V165TCX0.1HA V165TCZ0.1H0

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Wave Direction in Chung-Yun Seas of TCX0 at 2016

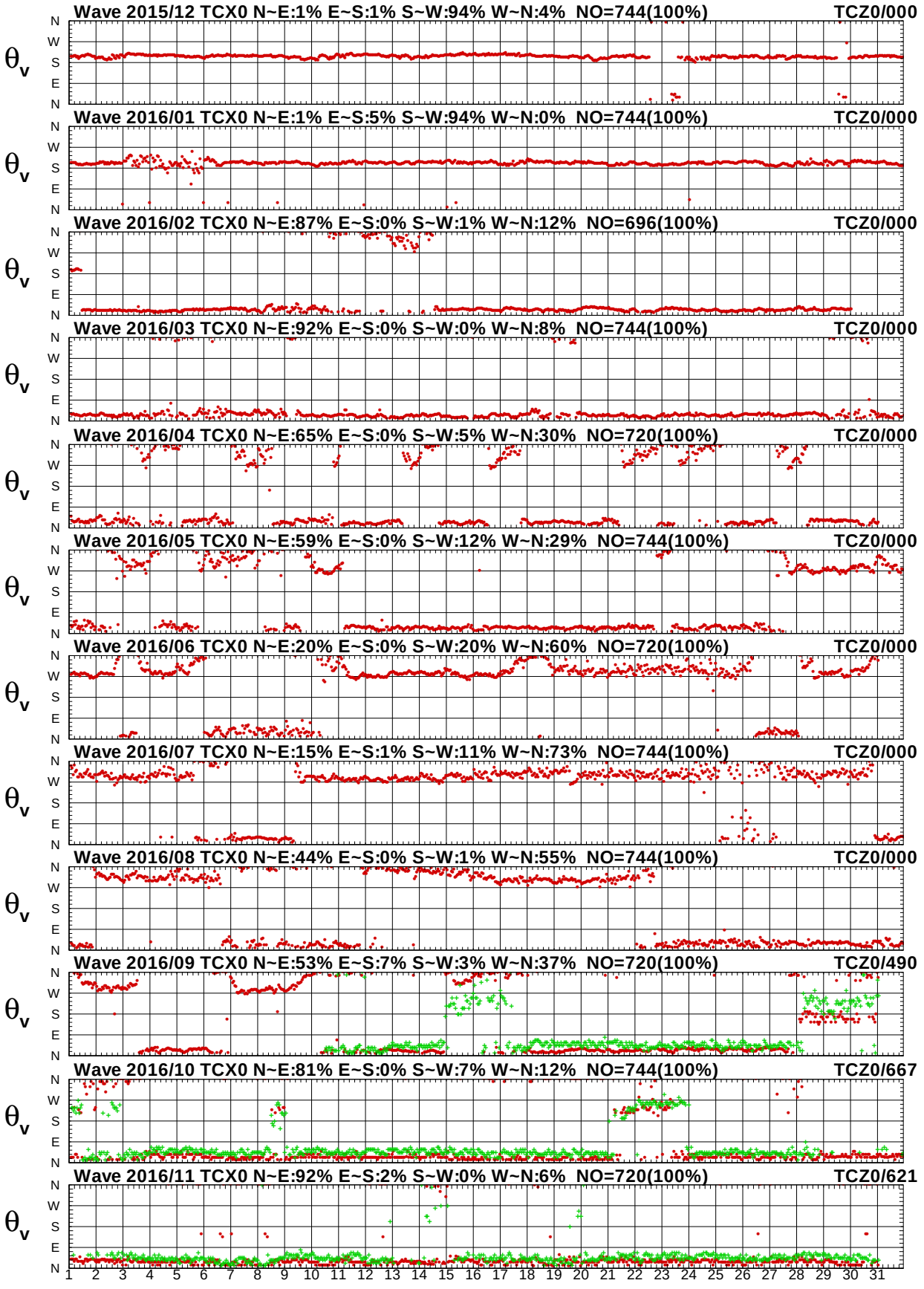

圖 2.3c　2016年每月中雲海域 X 站與 Z 站波向比較圖

V15CTCX0.1HA V15CTCZ0.1H0 V161TCX0.1HA V161TCZ0.1H0 V162TCX0.1HA V162TCZ0.1H0
V163TCX0.1HA V163TCZ0.1H0 V164TCX0.1HA V164TCZ0.1H0 V165TCX0.1HA V165TCZ0.1H0

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Wave H_s in Chung-Yun Seas of TCX0 at 2016

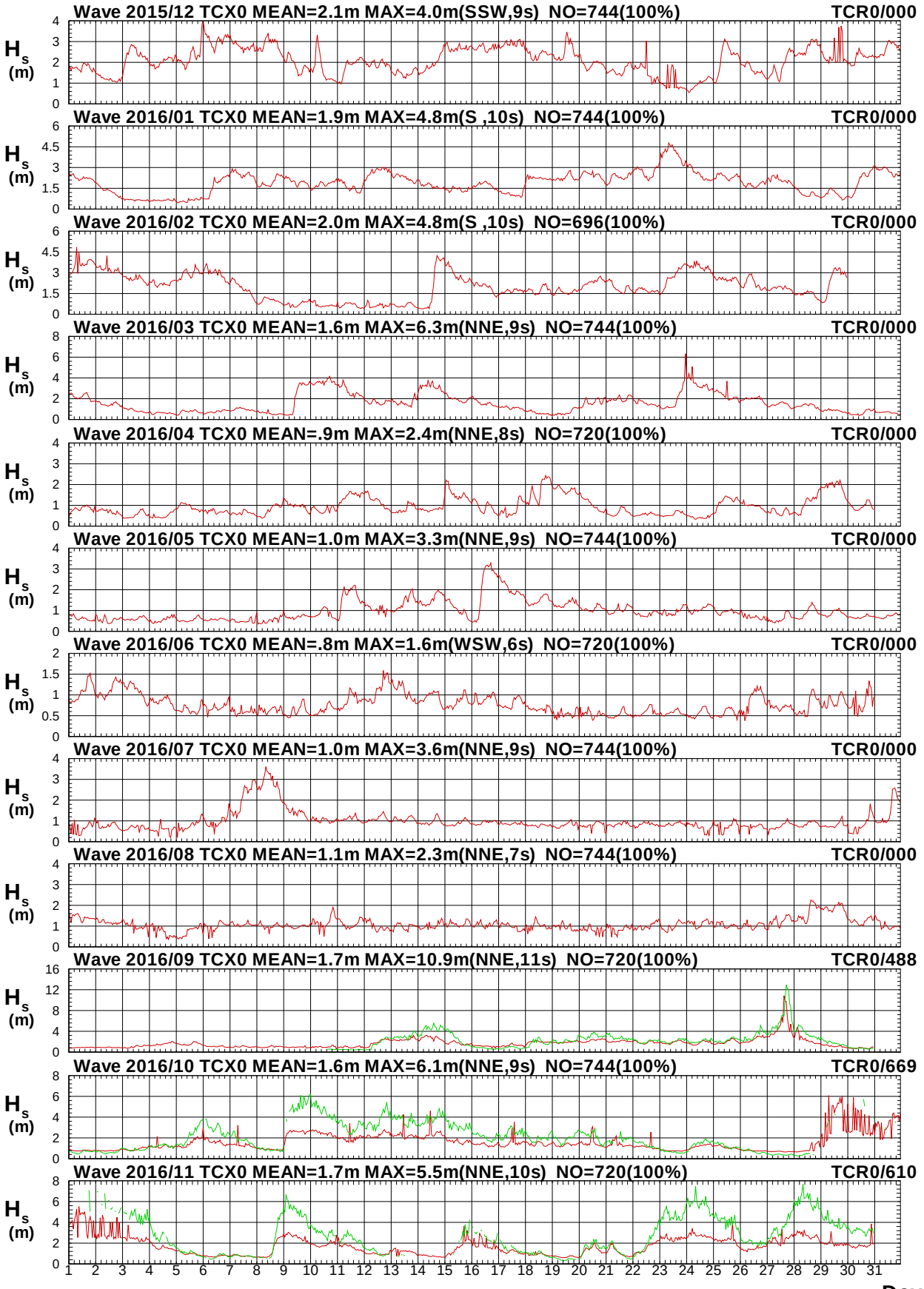

圖 2.4a　2016年每月中雲海域 X 站與 R 站波高比較圖

V15CTCX0.1HA V15CTCR0.1H0 V161TCX0.1HA V161TCR0.1H0 V162TCX0.1HA V162TCR0.1H0
V163TCX0.1HA V163TCR0.1H0 V164TCX0.1HA V164TCR0.1H0 V165TCX0.1HA V165TCR0.1H0

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Wave T_p in Chung-Yun Seas of TCX0 at 2016

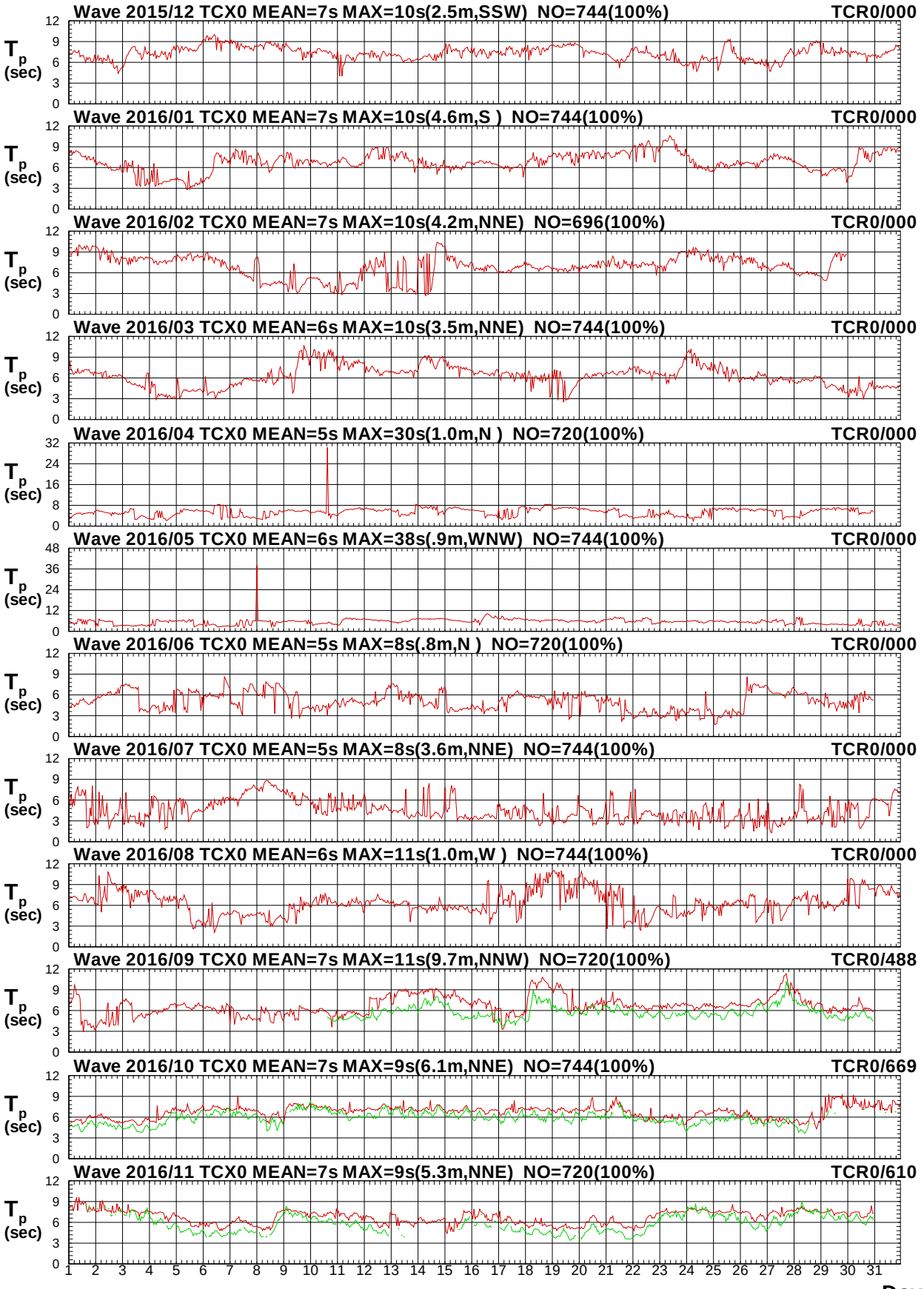

圖 2.4b　2016年每月中雲海域 X 站與 R 站週期比較圖

V15CTCX0.1HA V15CTCR0.1H0 V161TCX0.1HA V161TCR0.1H0 V162TCX0.1HA V162TCR0.1H0
V163TCX0.1HA V163TCR0.1H0 V164TCX0.1HA V164TCR0.1H0 V165TCX0.1HA V165TCR0.1H0

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Wave Direction in Chung-Yun Seas of TCX0 at 2016

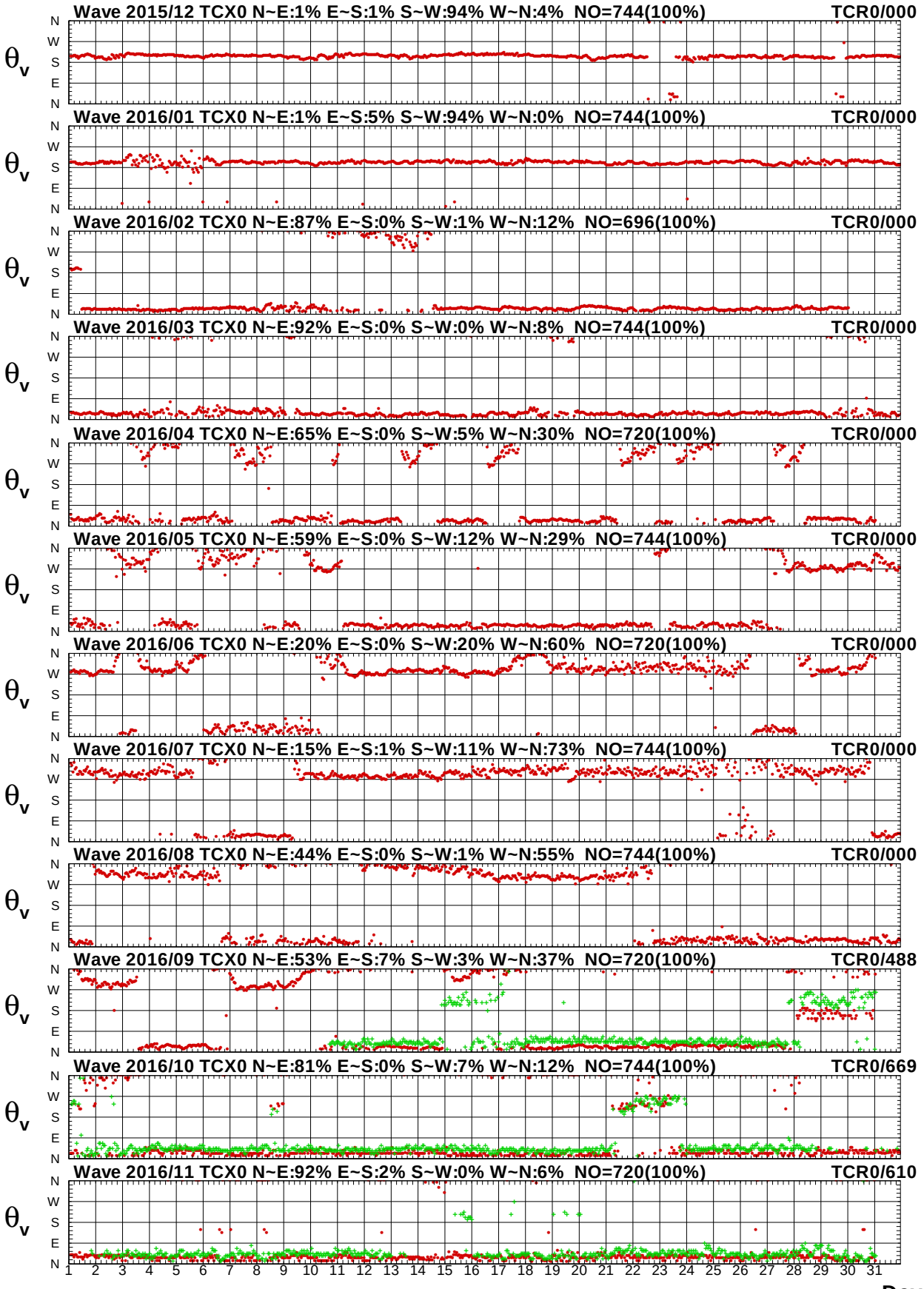

圖 2.4c　2016年每月中雲海域 X 站與 R 站波向比較圖

V15CTCX0.1HA V15CTCR0.1H0 V161TCX0.1HA V161TCR0.1H0 V162TCX0.1HA V162TCR0.1H0
V163TCX0.1HA V163TCR0.1H0 V164TCX0.1HA V164TCR0.1H0 V165TCX0.1HA V165TCR0.1H0

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Wave H_s in Chung-Yun Seas of TCX0 at 2016

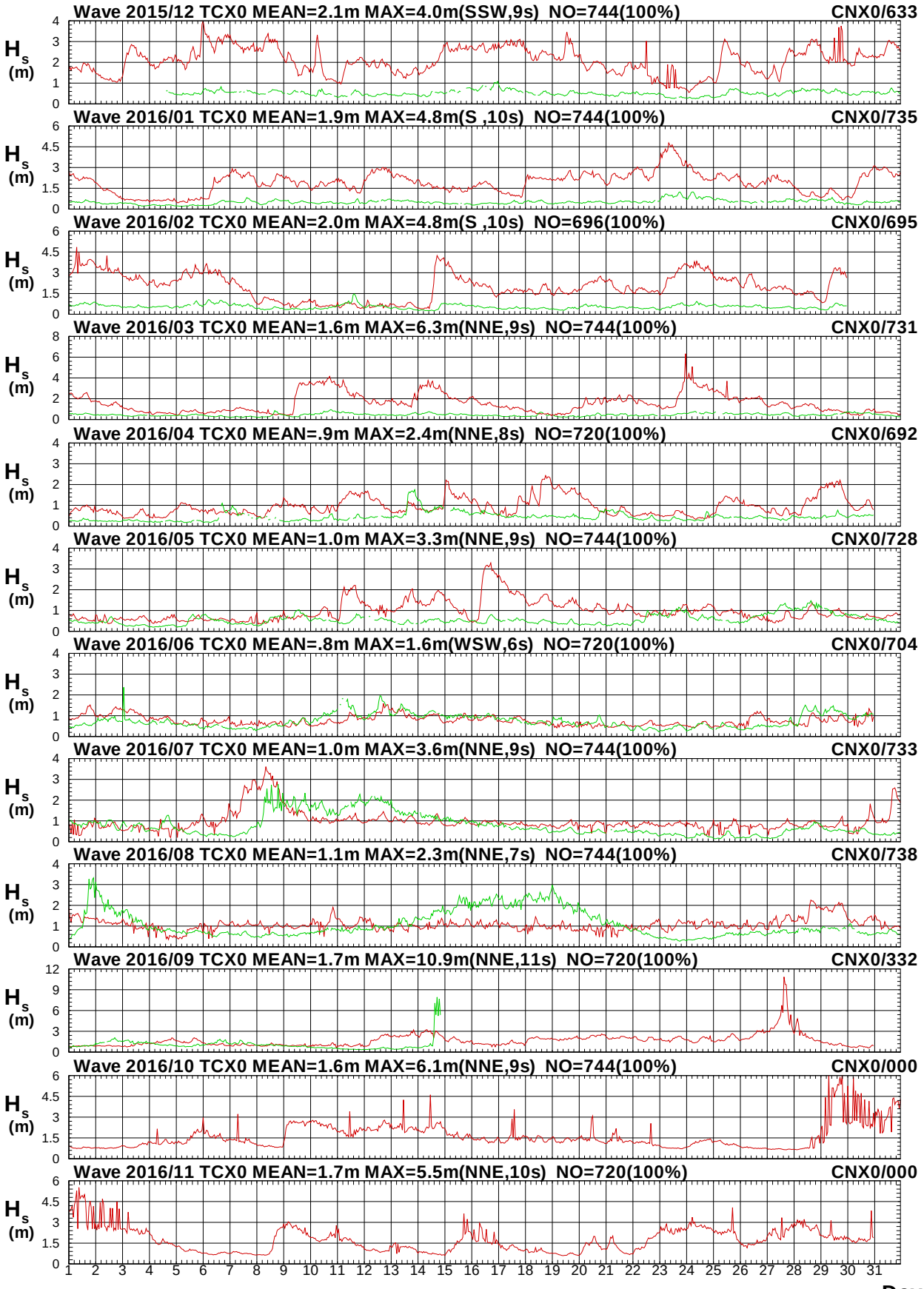

圖 2.5a　2016年每月中雲海域 X 站與嘉南海域 X 站波高圖

V15CTCX0.1HA V15CCNX0.1H0 V161TCX0.1HA V161CNX0.1H0 V162TCX0.1HA V162CNX0.1H0
V163TCX0.1HA V163CNX0.1H0 V164TCX0.1HA V164CNX0.1H0 V165TCX0.1HA V165CNX0.1H0

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Wave T_p in Chung-Yun Seas of TCX0 at 2016

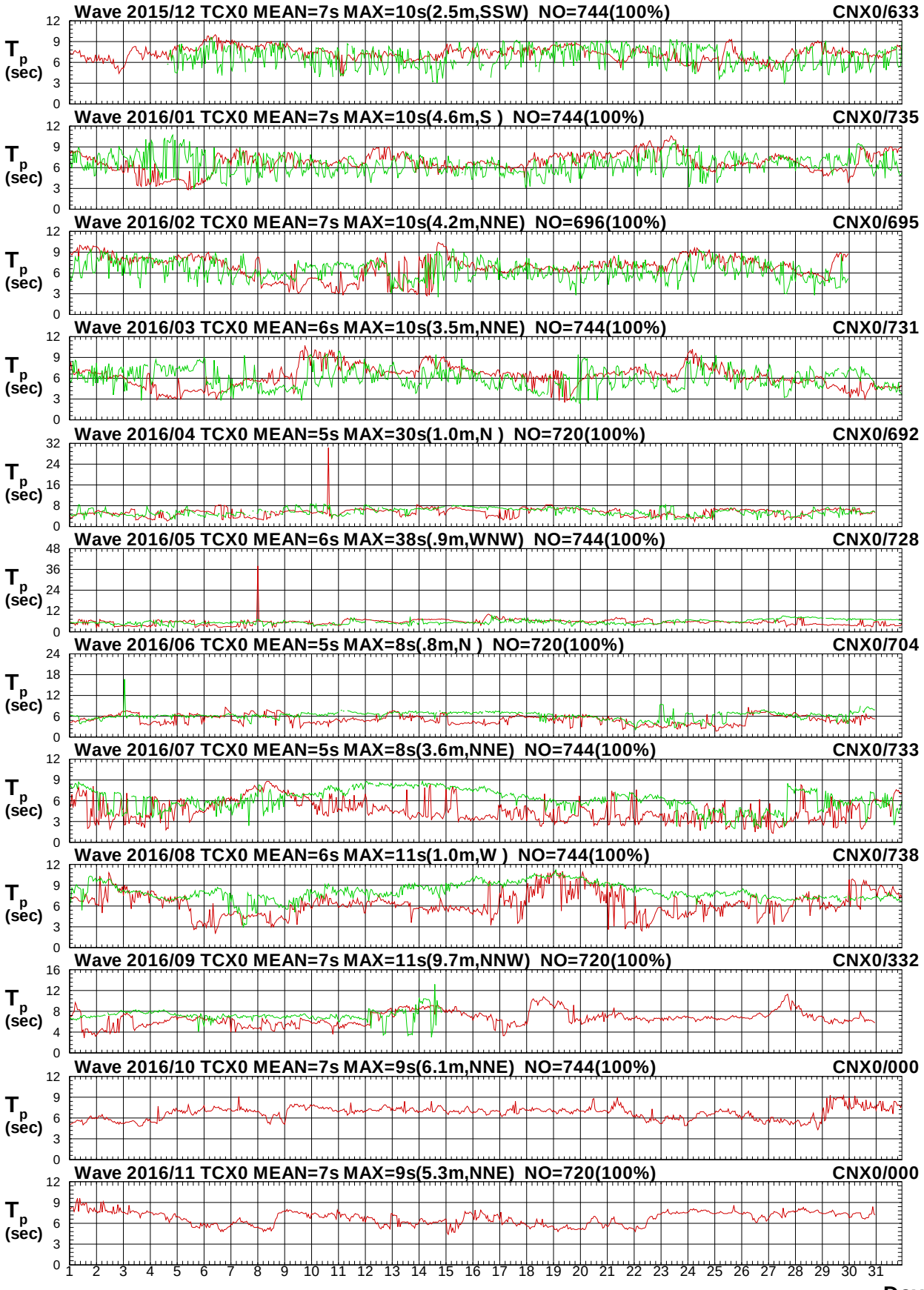

圖 2.5b　2016年每月中雲海域 X 站與嘉南海域 X 站週期圖

V15CTCX0.1HA V15CCNX0.1H0 V161TCX0.1HA V161CNX0.1H0 V162TCX0.1HA V162CNX0.1H0
V163TCX0.1HA V163CNX0.1H0 V164TCX0.1HA V164CNX0.1H0 V165TCX0.1HA V165CNX0.1H0

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Wave Direction in Chung-Yun Seas of TCX0 at 2016

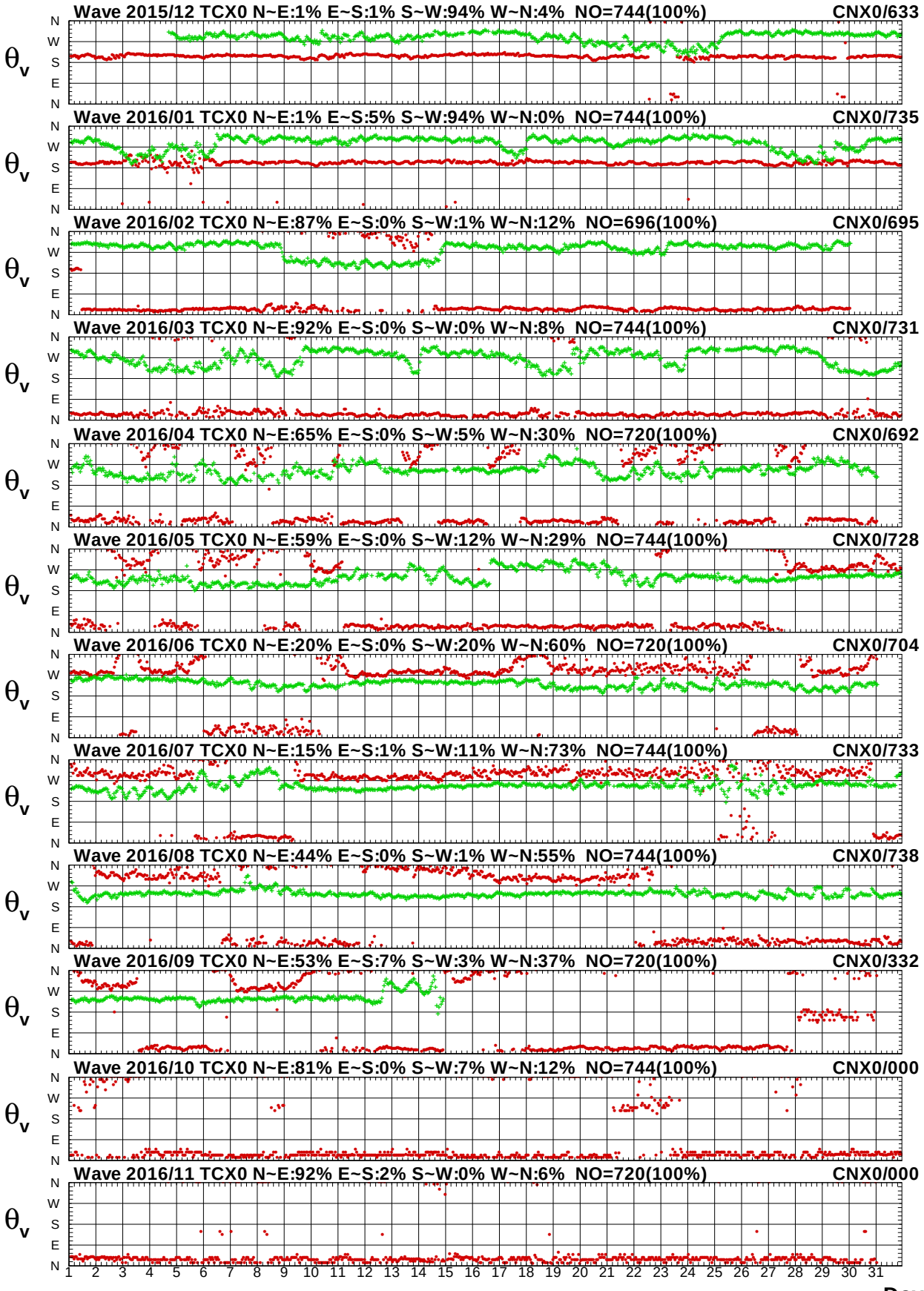

圖 2.5c　2016年每月中雲海域 X 站與嘉南海域 X 站波向圖

V15CTCX0.1HA V15CCNX0.1H0 V161TCX0.1HA V161CNX0.1H0 V162TCX0.1HA V162CNX0.1H0
V163TCX0.1HA V163CNX0.1H0 V164TCX0.1HA V164CNX0.1H0 V165TCX0.1HA V165CNX0.1H0

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Wave H_s in Chung-Yun Seas of TCX0 at 2016

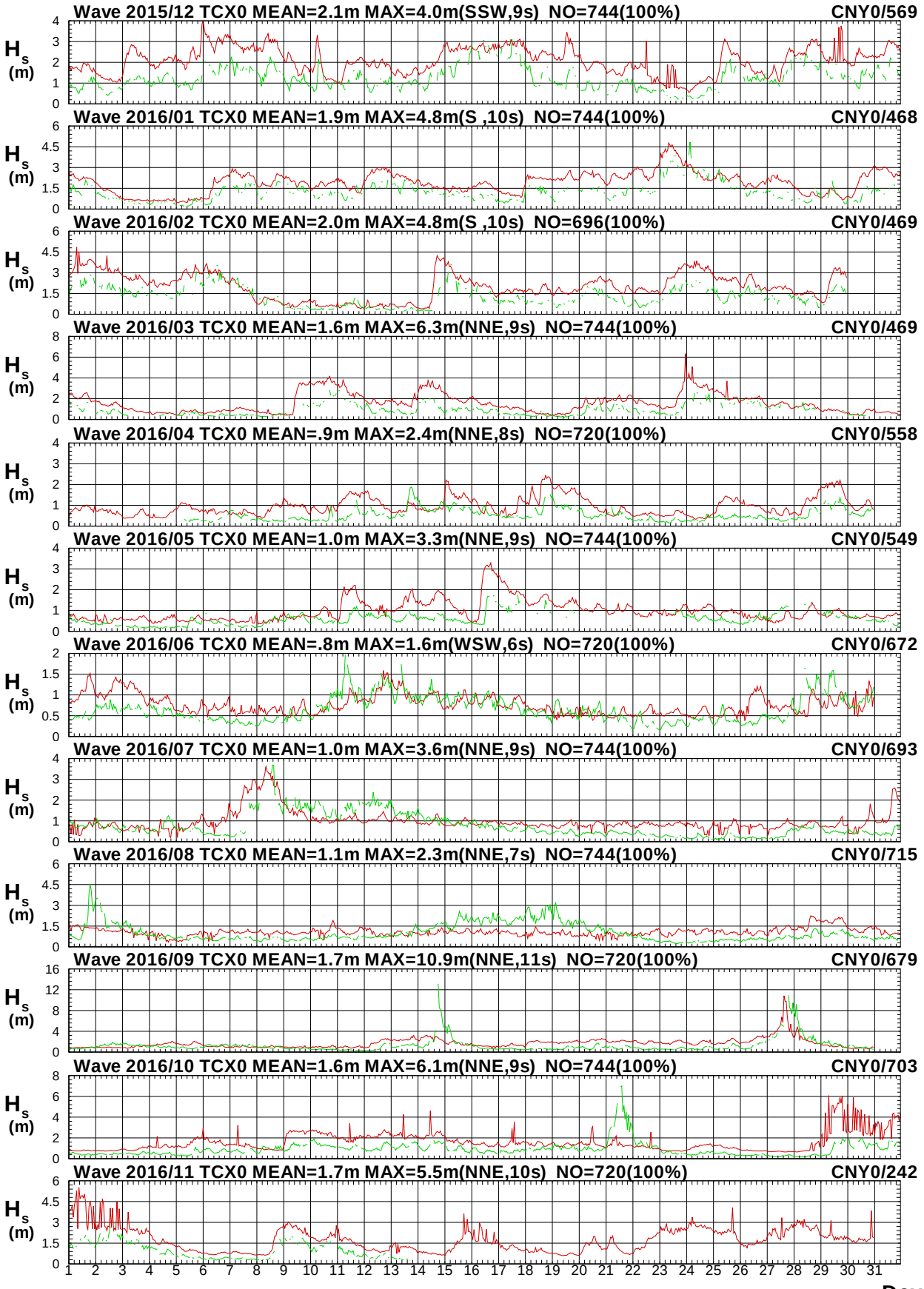

圖 2.6a　2016年每月中雲海域 X 站與嘉南海域 Y 站波高圖

V15CTCX0.1HA V15CCNY0.1H0 V161TCX0.1HA V161CNY0.1H0 V162TCX0.1HA V162CNY0.1H0
V163TCX0.1HA V163CNY0.1H0 V164TCX0.1HA V164CNY0.1H0 V165TCX0.1HA V165CNY0.1H0

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Wave T_p in Chung-Yun Seas of TCX0 at 2016

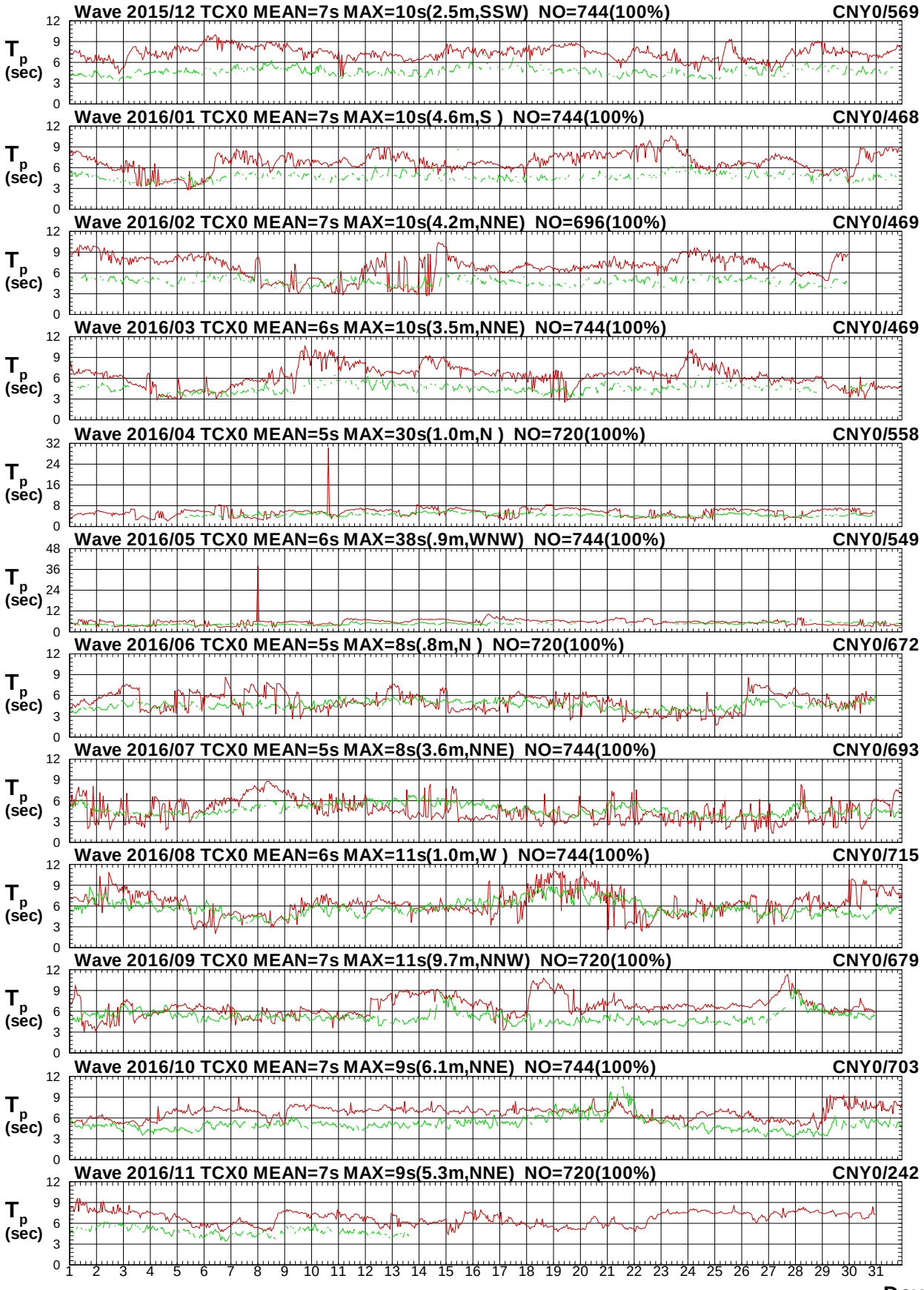

圖 2.6b　2016年每月中雲海域 X 站與嘉南海域 Y 站週期圖

V15CTCX0.1HA V15CCNY0.1H0 V161TCX0.1HA V161CNY0.1H0 V162TCX0.1HA V162CNY0.1H0
V163TCX0.1HA V163CNY0.1H0 V164TCX0.1HA V164CNY0.1H0 V165TCX0.1HA V165CNY0.1H0

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Wave Direction in Chung-Yun Seas of TCX0 at 2016

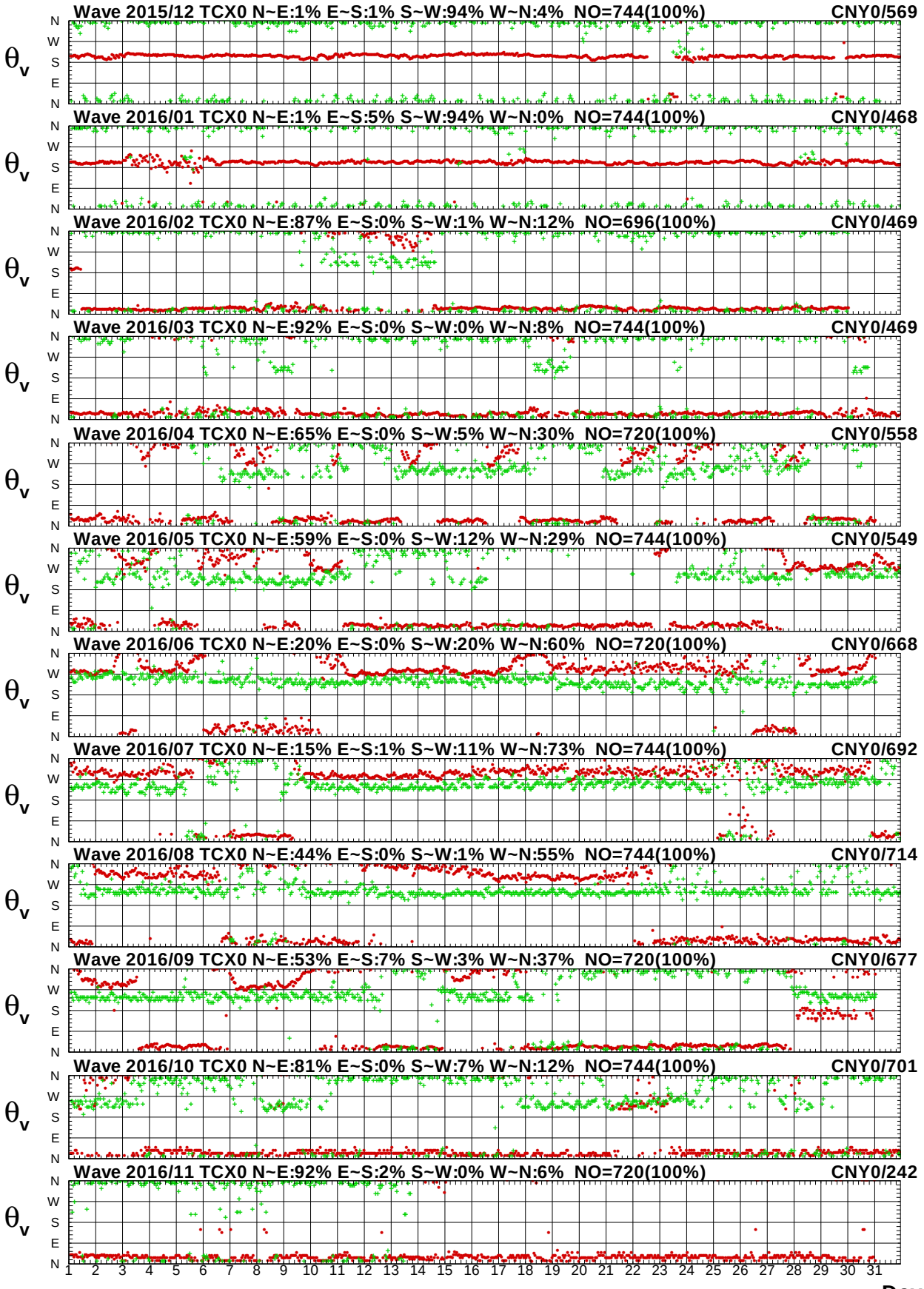

圖 2.6c　2016年每月中雲海域 X 站與嘉南海域 Y 站波向圖

V15CTCX0.1HA V15CCNY0.1H0 V161TCX0.1HA V161CNY0.1H0 V162TCX0.1HA V162CNY0.1H0
V163TCX0.1HA V163CNY0.1H0 V164TCX0.1HA V164CNY0.1H0 V165TCX0.1HA V165CNY0.1H0

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Wave H_s in Chung-Yun Seas of TCX0 at 2016

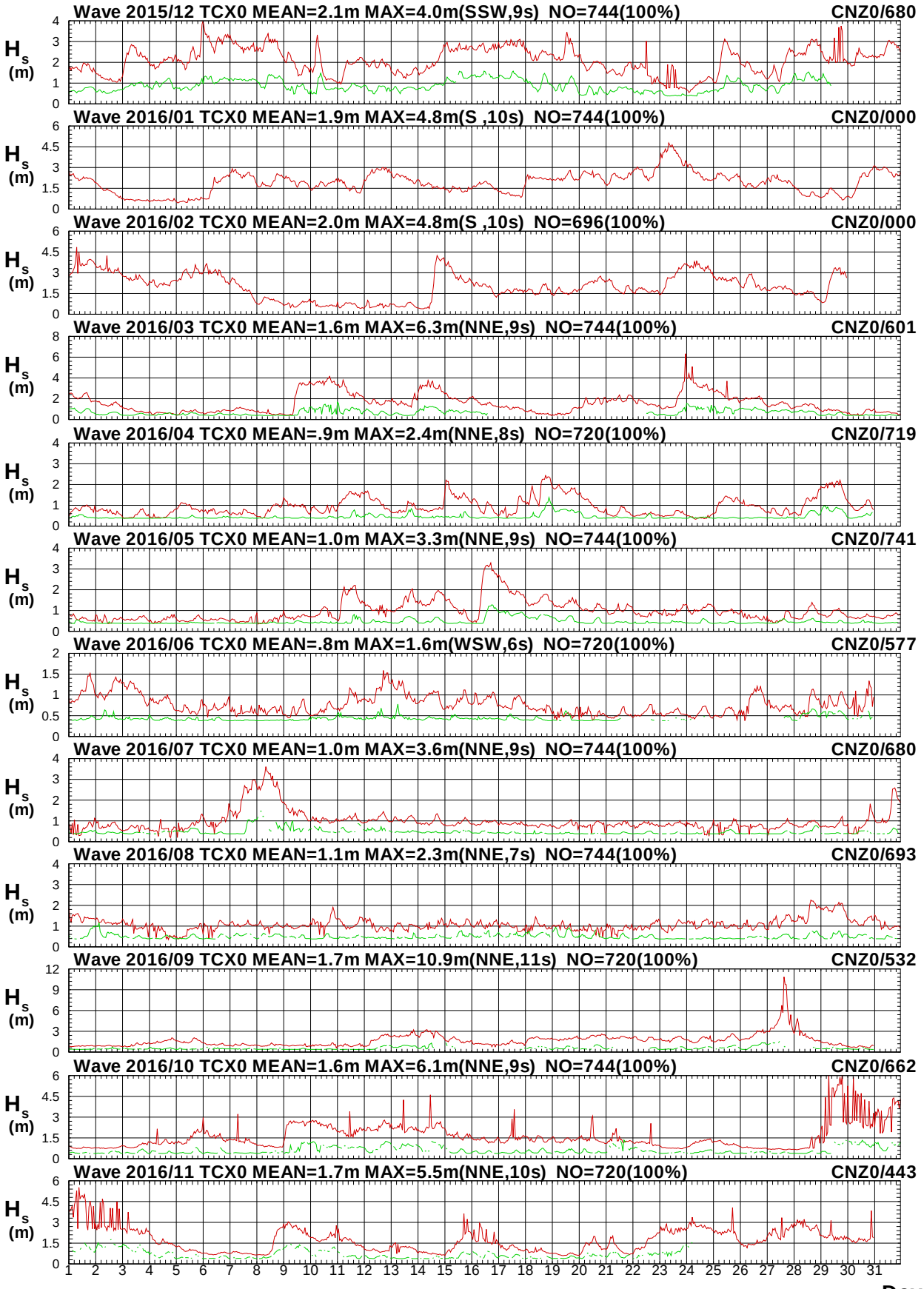

圖 2.7a　2016年每月中雲海域 X 站與嘉南海域 Z 站波高圖

V15CTCX0.1HA V15CCNZ0.1H0 V161TCX0.1HA V161CNZ0.1H0 V162TCX0.1HA V162CNZ0.1H0
V163TCX0.1HA V163CNZ0.1H0 V164TCX0.1HA V164CNZ0.1H0 V165TCX0.1HA V165CNZ0.1H0

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Wave T_p in Chung-Yun Seas of TCX0 at 2016

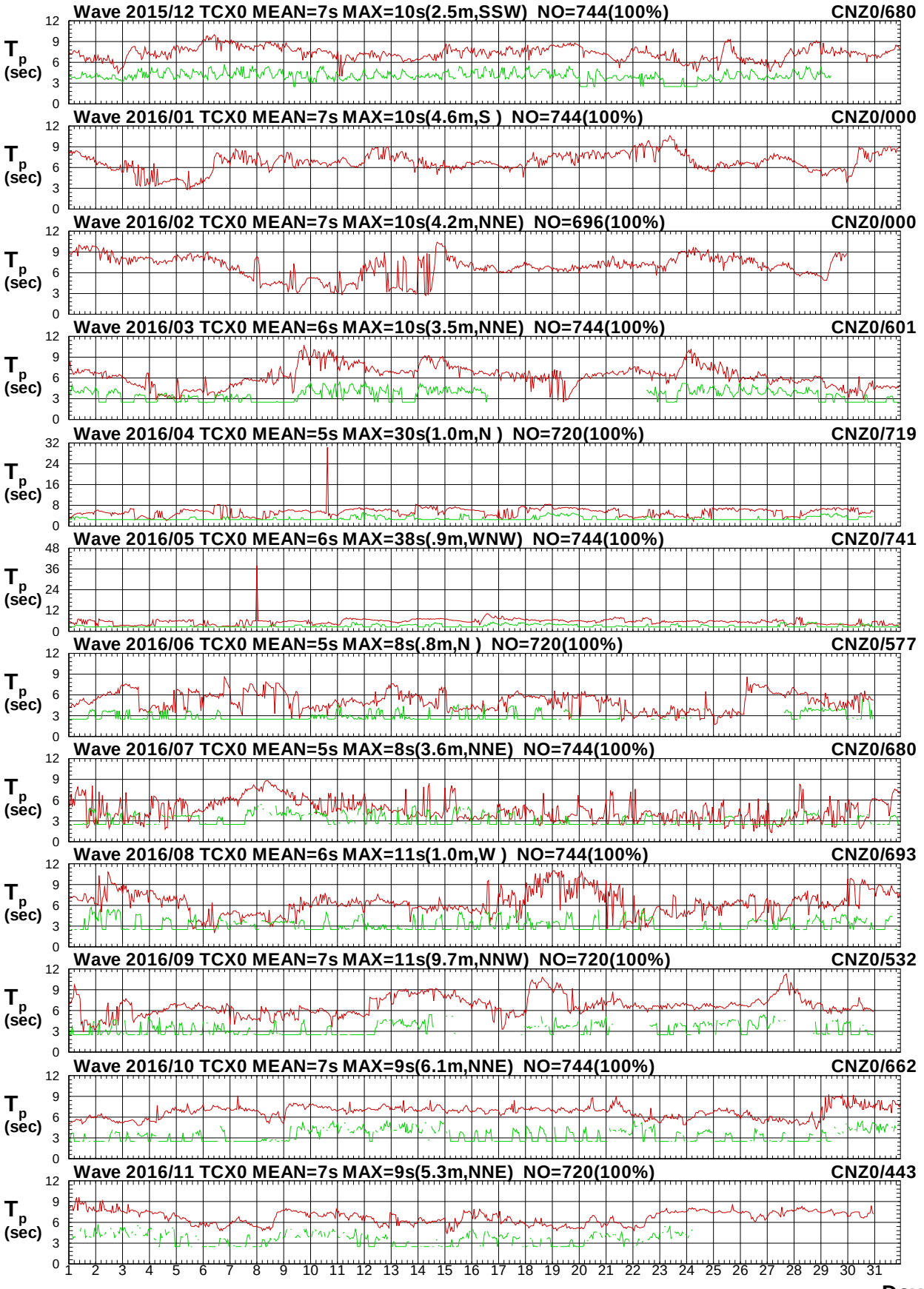

圖 2.7b　2016年每月中雲海域 X 站與嘉南海域 Z 站週期圖

V15CTCX0.1HA V15CCNZ0.1H0 V161TCX0.1HA V161CNZ0.1H0 V162TCX0.1HA V162CNZ0.1H0
V163TCX0.1HA V163CNZ0.1H0 V164TCX0.1HA V164CNZ0.1H0 V165TCX0.1HA V165CNZ0.1H0

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Wave Direction in Chung-Yun Seas of TCX0 at 2016

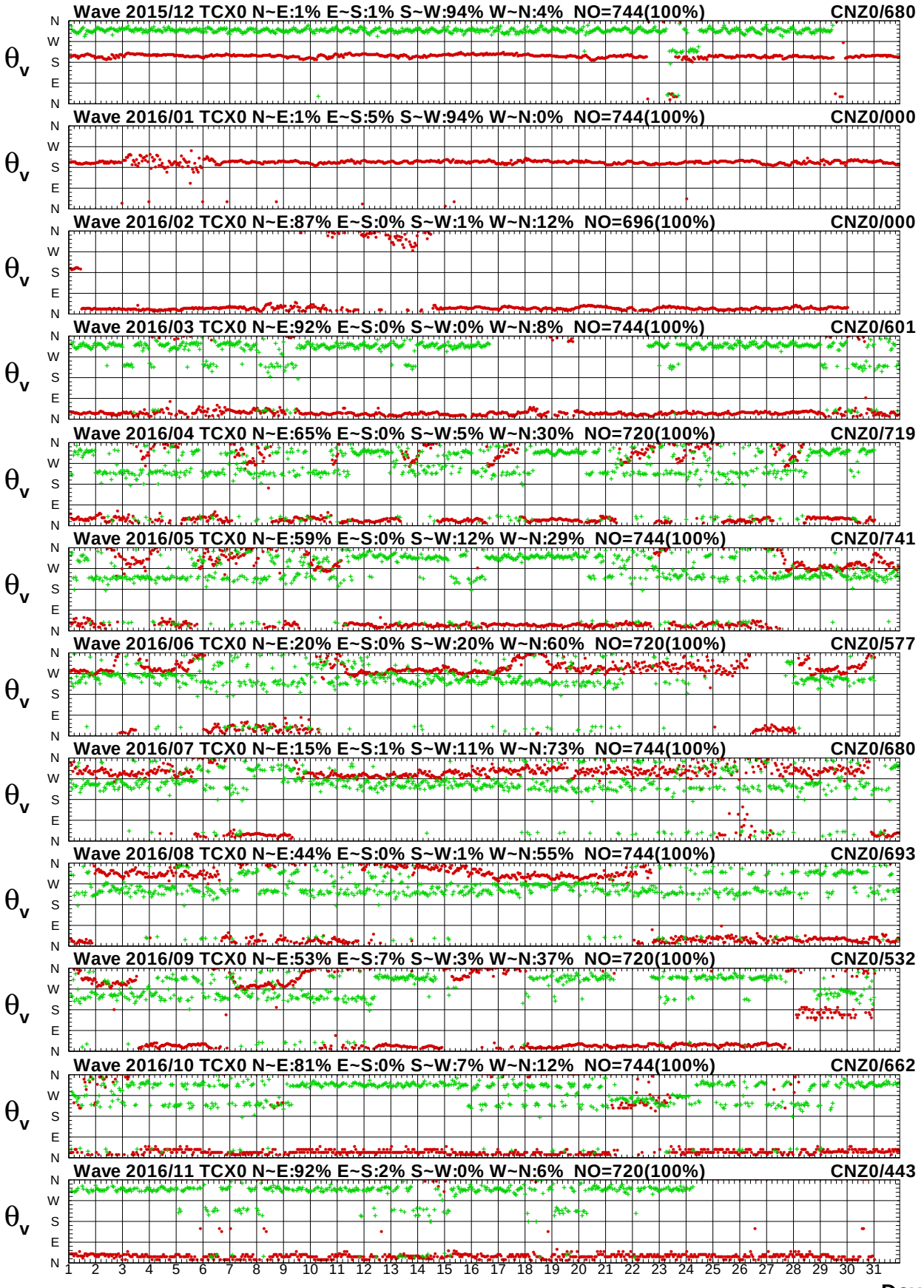

圖2.7c　2016年每月中雲海域 X 站與嘉南海域 Z 站波向圖

V15CTCX0.1HA V15CCNZ0.1H0 V161TCX0.1HA V161CNZ0.1H0 V162TCX0.1HA V162CNZ0.1H0
V163TCX0.1HA V163CNZ0.1H0 V164TCX0.1HA V164CNZ0.1H0 V165TCX0.1HA V165CNZ0.1H0

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Wave H_s in Chung-Yun Seas of TCX0 at 2016

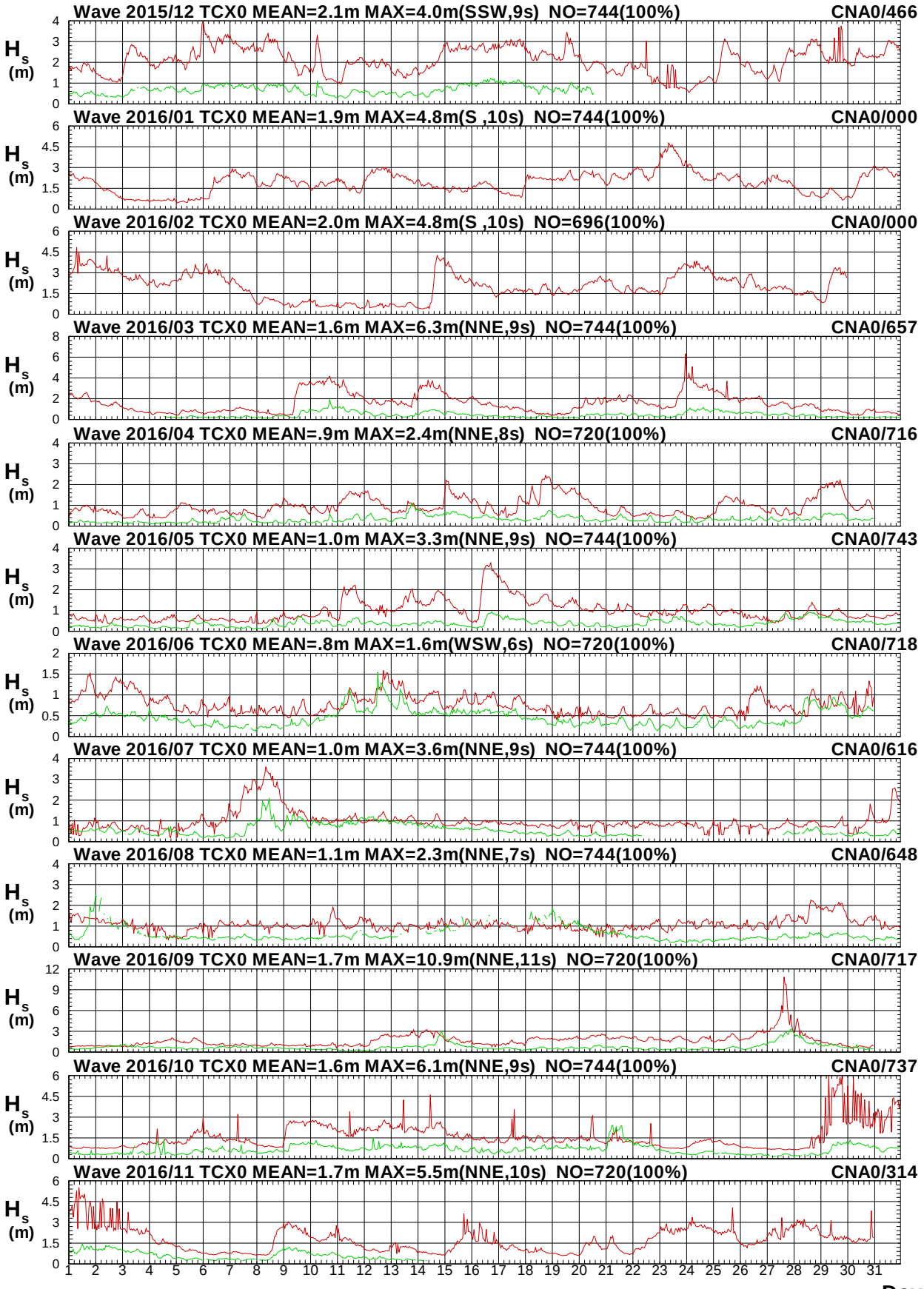

圖 2.8a　2016年每月中雲海域 X 站與嘉南海域 A 站波高圖

Wave T_p in Chung-Yun Seas of TCX0 at 2016

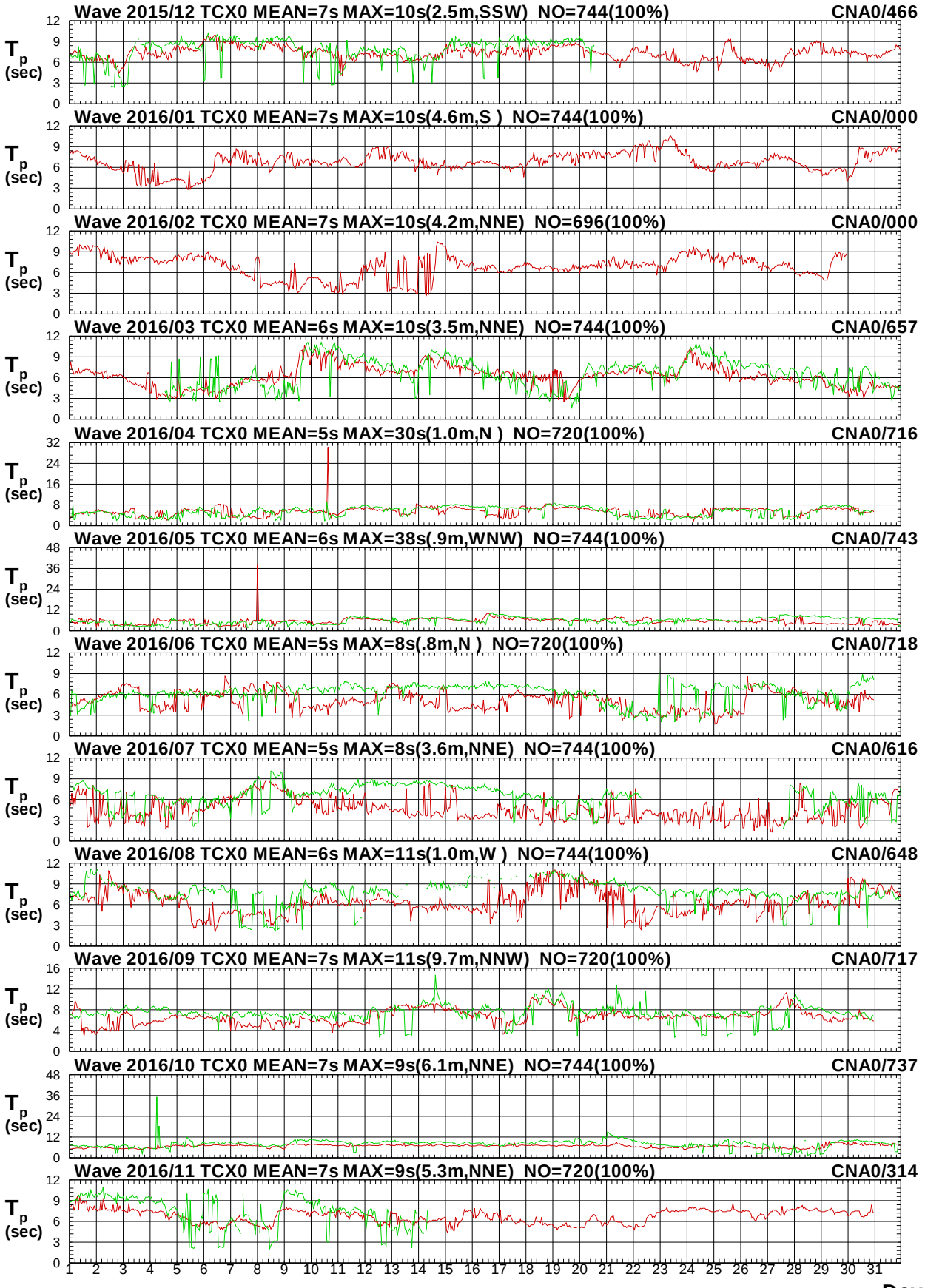

圖 2.8b　2016年每月中雲海域 X 站與嘉南海域 A 站週期圖

V15CTCX0.1HA V15CCNA0.1H0 V161TCX0.1HA V161CNA0.1H0 V162TCX0.1HA V162CNA0.1H0
V163TCX0.1HA V163CNA0.1H0 V164TCX0.1HA V164CNA0.1H0 V165TCX0.1HA V165CNA0.1H0

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Wave Direction in Chung-Yun Seas of TCX0 at 2016

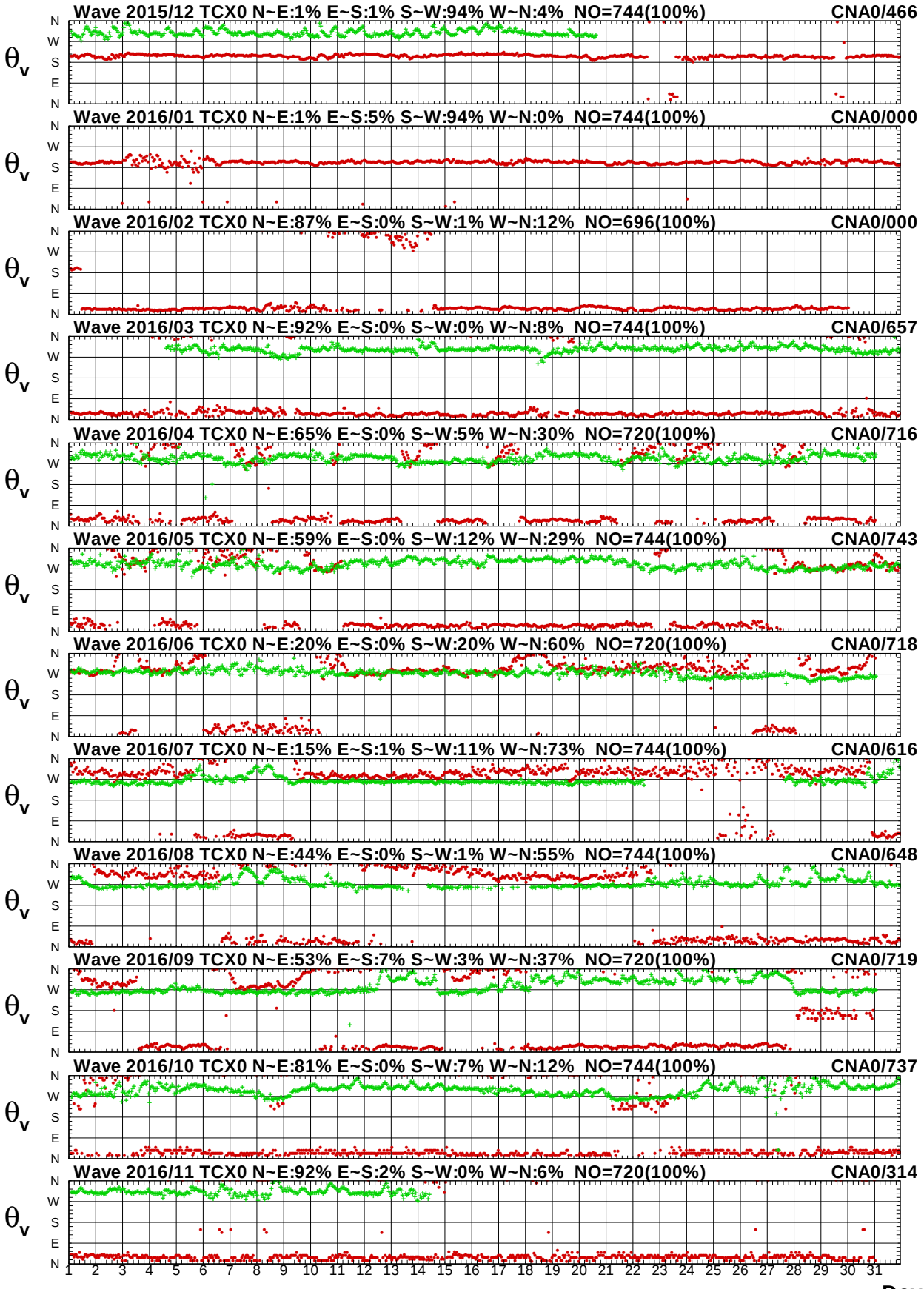

圖 2.8c　2016年每月中雲海域 X 站與嘉南海域 A 站波向圖

V15CTCX0.1HA V15CCNA0.1H0 V161TCX0.1HA V161CNA0.1H0 V162TCX0.1HA V162CNA0.1H0
V163TCX0.1HA V163CNA0.1H0 V164TCX0.1HA V164CNA0.1H0 V165TCX0.1HA V165CNA0.1H0

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Wave H_s in Chung-Yun Seas of TCX0 at 2016

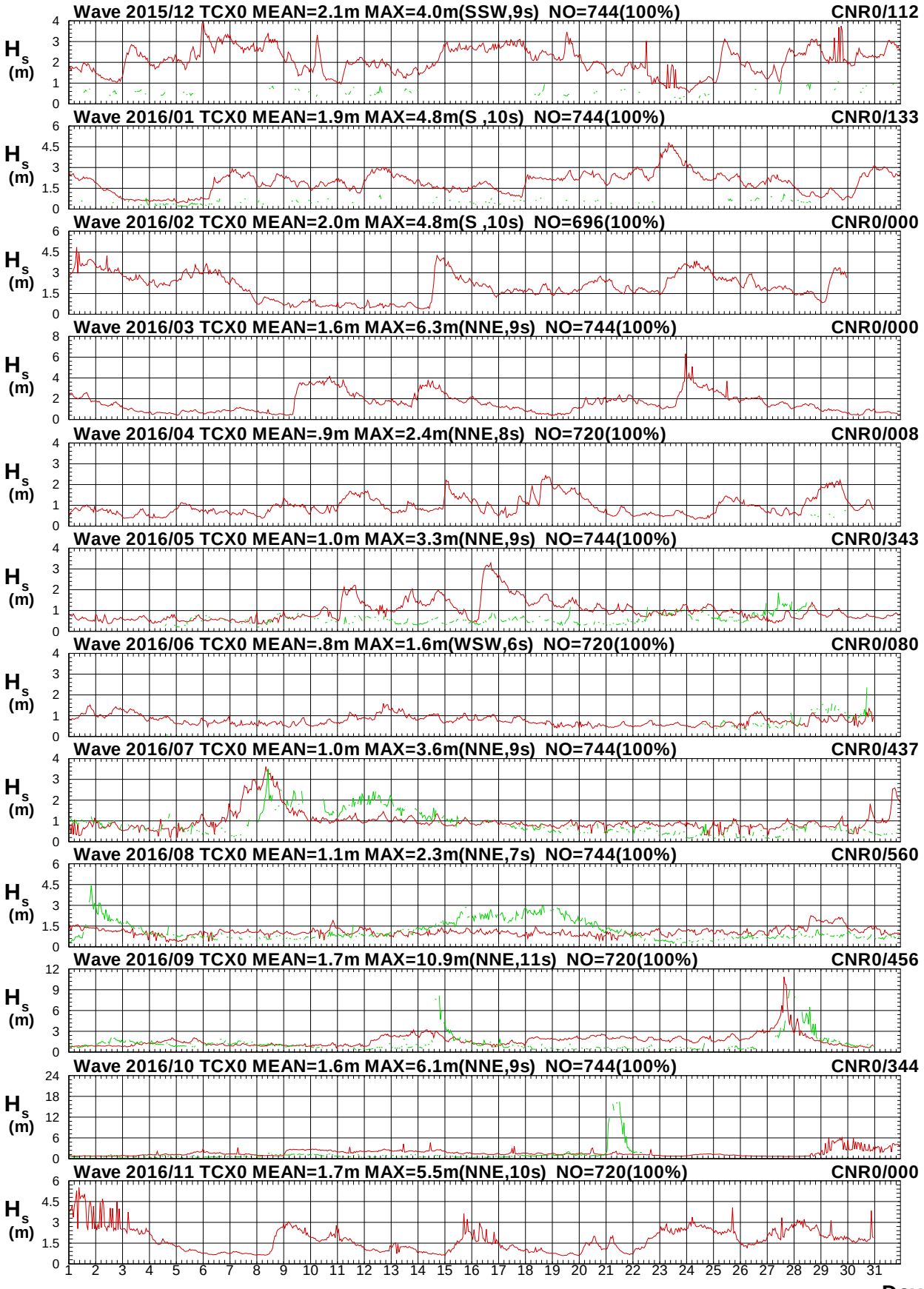

圖 2.9a　2016年每月中雲海域 X 站與嘉南海域 R 站波高圖

V15CTCX0.1HA V15CCNR0.1H0 V161TCX0.1HA V161CNR0.1H0 V162TCX0.1HA V162CNR0.1H0
V163TCX0.1HA V163CNR0.1H0 V164TCX0.1HA V164CNR0.1H0 V165TCX0.1HA V165CNR0.1H0

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Wave T_p in Chung-Yun Seas of TCX0 at 2016

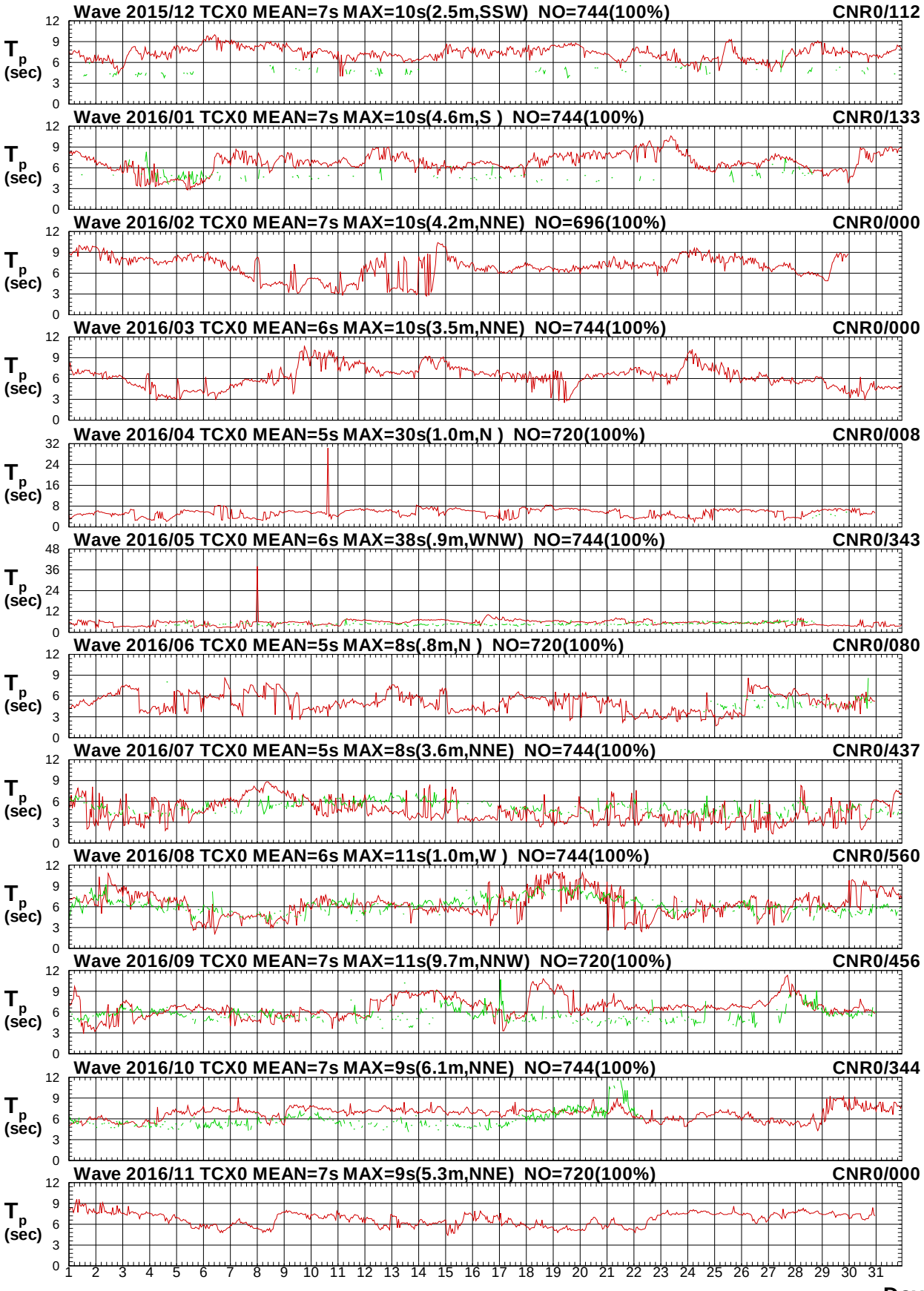

圖 2.9b　2016年每月中雲海域 X 站與嘉南海域 R 站週期圖

V15CTCX0.1HA V15CCNR0.1H0 V161TCX0.1HA V161CNR0.1H0 V162TCX0.1HA V162CNR0.1H0
V163TCX0.1HA V163CNR0.1H0 V164TCX0.1HA V164CNR0.1H0 V165TCX0.1HA V165CNR0.1H0

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Wave Direction in Chung-Yun Seas of TCX0 at 2016

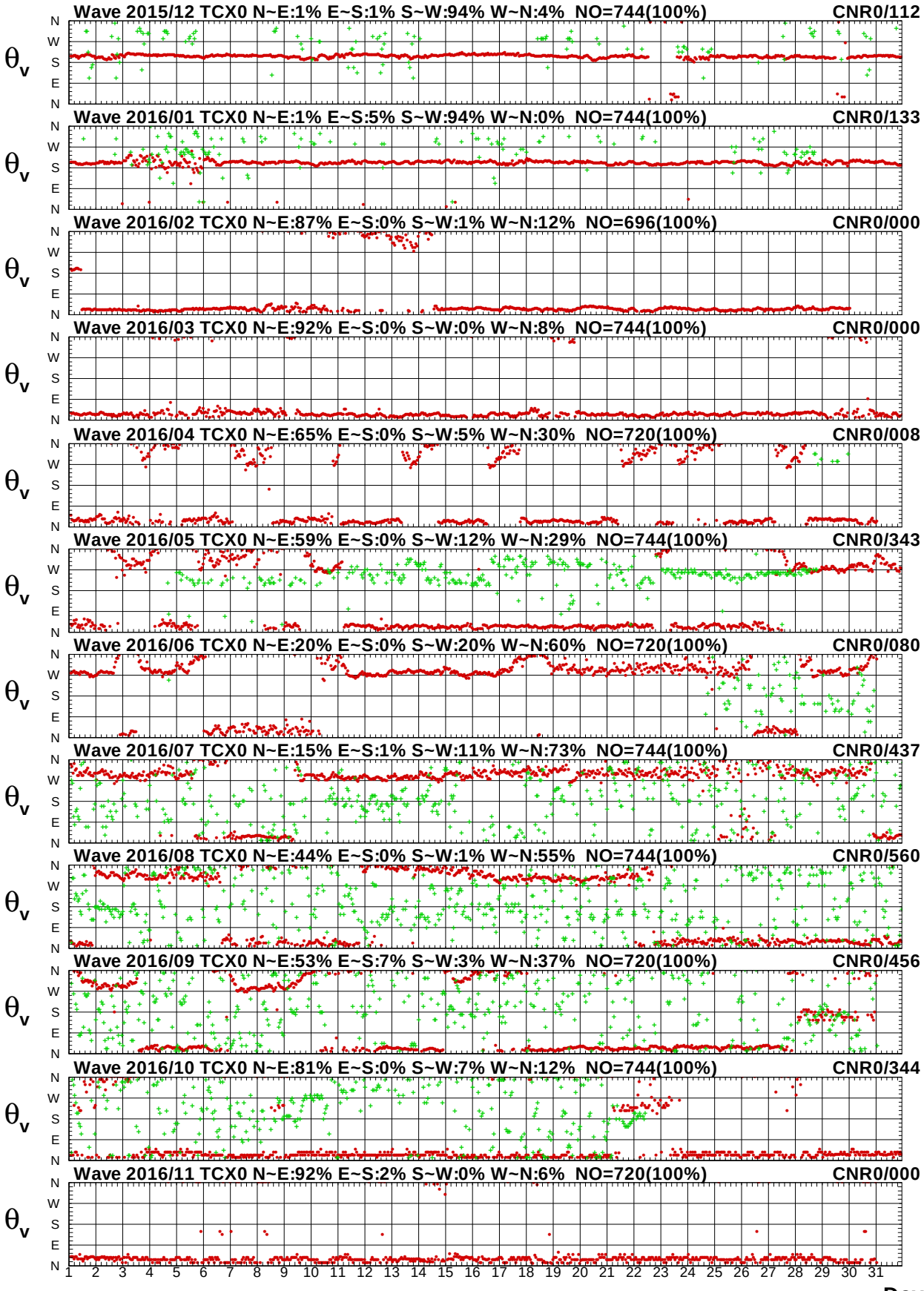

圖 2.9c　2016年每月中雲海域 X 站與嘉南海域 R 站波向圖

V15CTCX0.1HA V15CCNR0.1H0 V161TCX0.1HA V161CNR0.1H0 V162TCX0.1HA V162CNR0.1H0
V163TCX0.1HA V163CNR0.1H0 V164TCX0.1HA V164CNR0.1H0 V165TCX0.1HA V165CNR0.1H0

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Wave H_s in Chung-Yun Seas of TCX0 at 2016

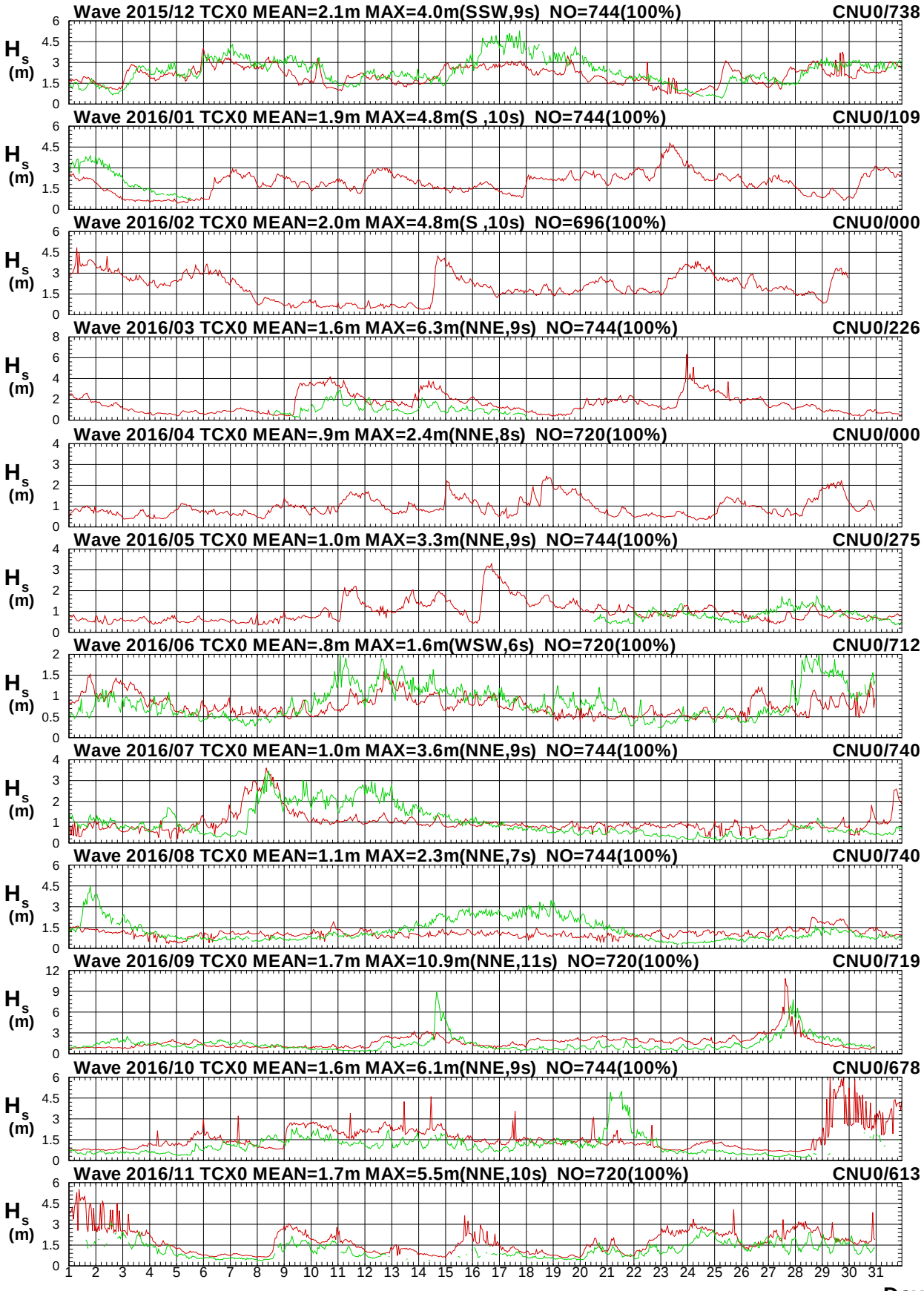

圖 2.10a　2016年每月中雲海域 X 站與嘉南海域 U 站波高圖

V15CTCX0.1HA V15CCNU0.1H0 V161TCX0.1HA V161CNU0.1H0 V162TCX0.1HA V162CNU0.1H0
V163TCX0.1HA V163CNU0.1H0 V164TCX0.1HA V164CNU0.1H0 V165TCX0.1HA V165CNU0.1H0

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Wave T_p in Chung-Yun Seas of TCX0 at 2016

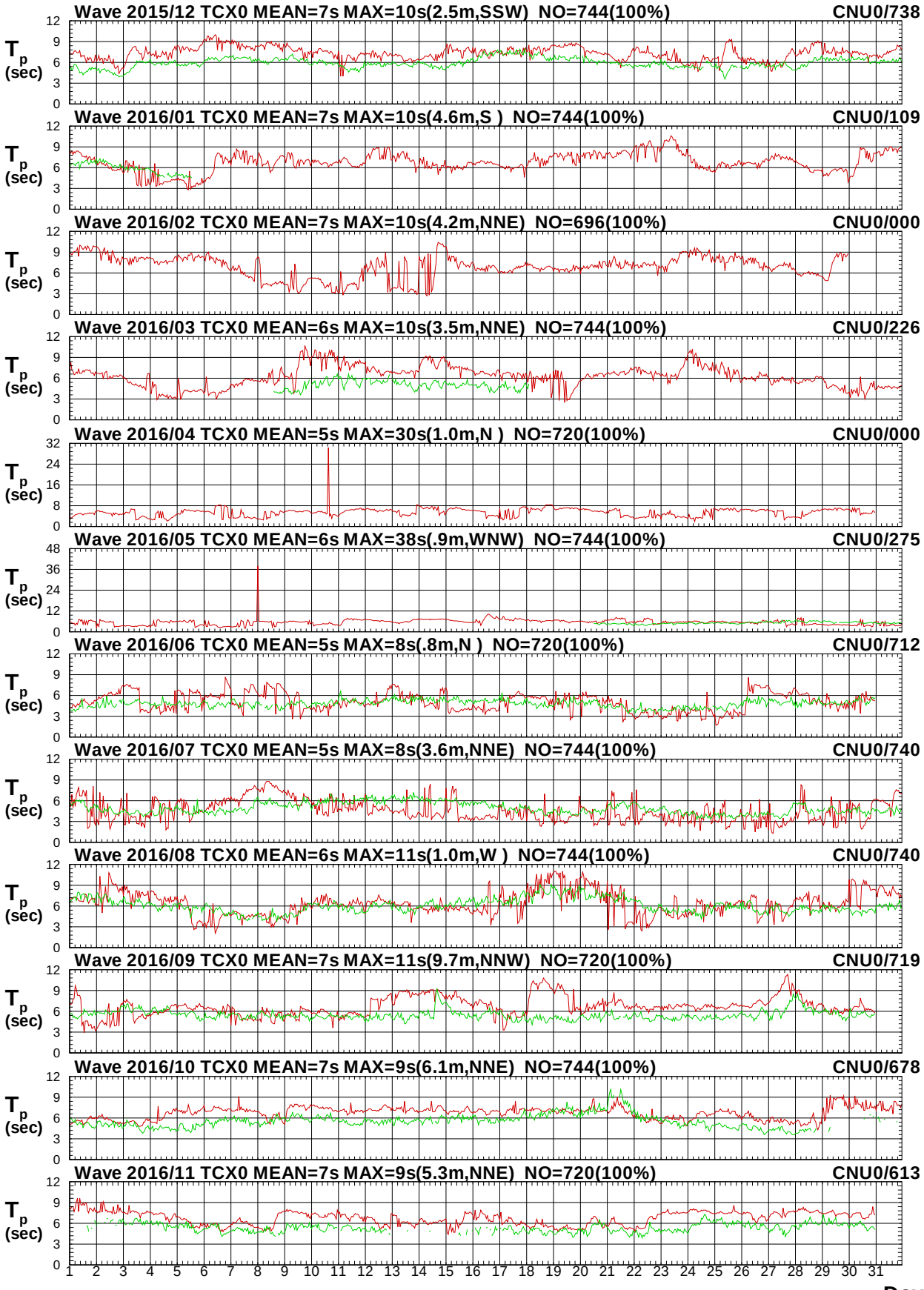

圖 2.10b　2016年每月中雲海域 X 站與嘉南海域 U 站週期圖

V15CTCX0.1HA V15CCNU0.1H0 V161TCX0.1HA V161CNU0.1H0 V162TCX0.1HA V162CNU0.1H0
V163TCX0.1HA V163CNU0.1H0 V164TCX0.1HA V164CNU0.1H0 V165TCX0.1HA V165CNU0.1H0

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Wave Direction in Chung-Yun Seas of TCX0 at 2016

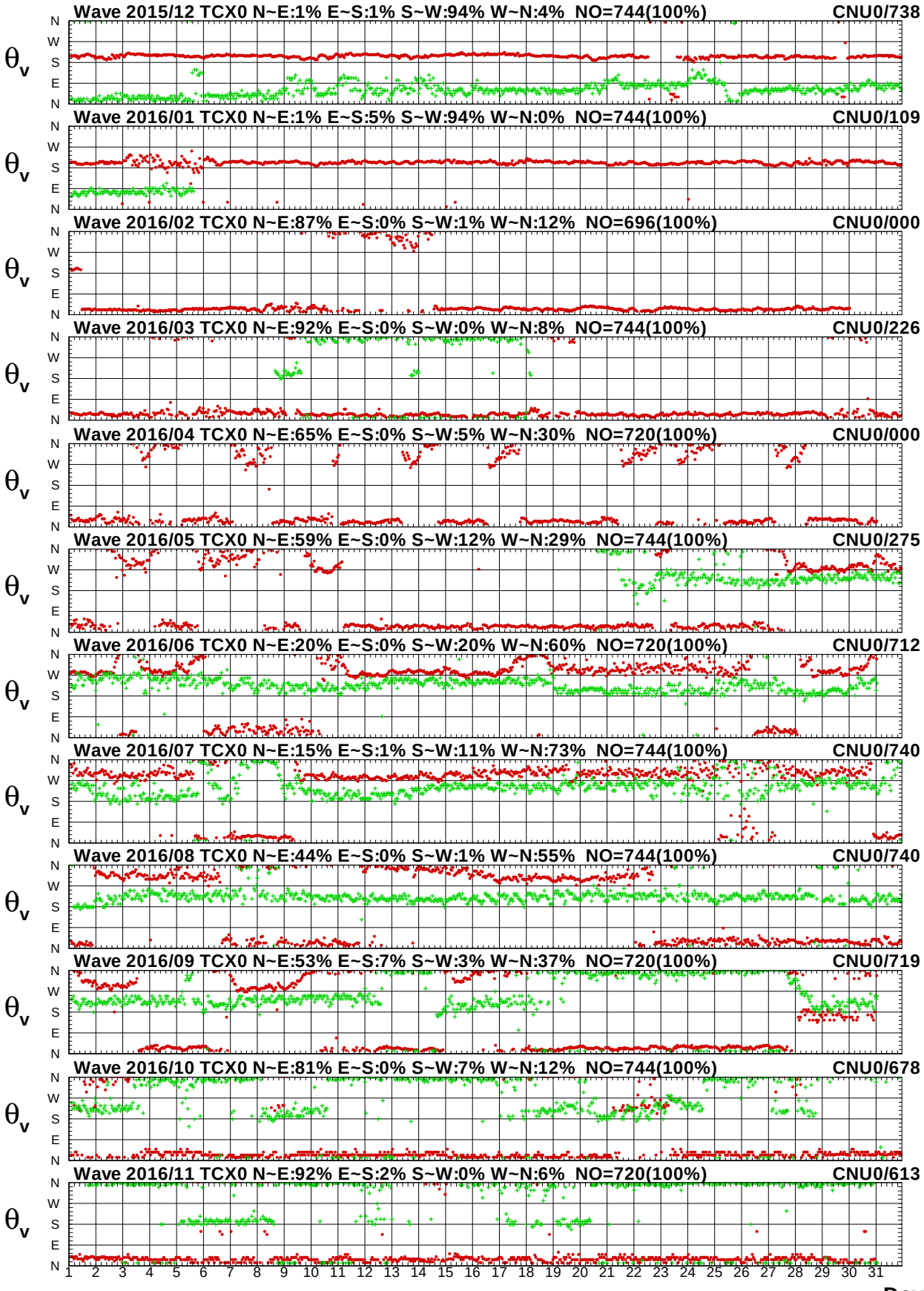

圖2.10c　2016年每月中雲海域 X 站與嘉南海域 U 站波向圖

V15CTCX0.1HA V15CCNU0.1H0 V161TCX0.1HA V161CNU0.1H0 V162TCX0.1HA V162CNU0.1H0
V163TCX0.1HA V163CNU0.1H0 V164TCX0.1HA V164CNU0.1H0 V165TCX0.1HA V165CNU0.1H0

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Wave H_s in Chung-Yun Seas of TCX0 at 2016

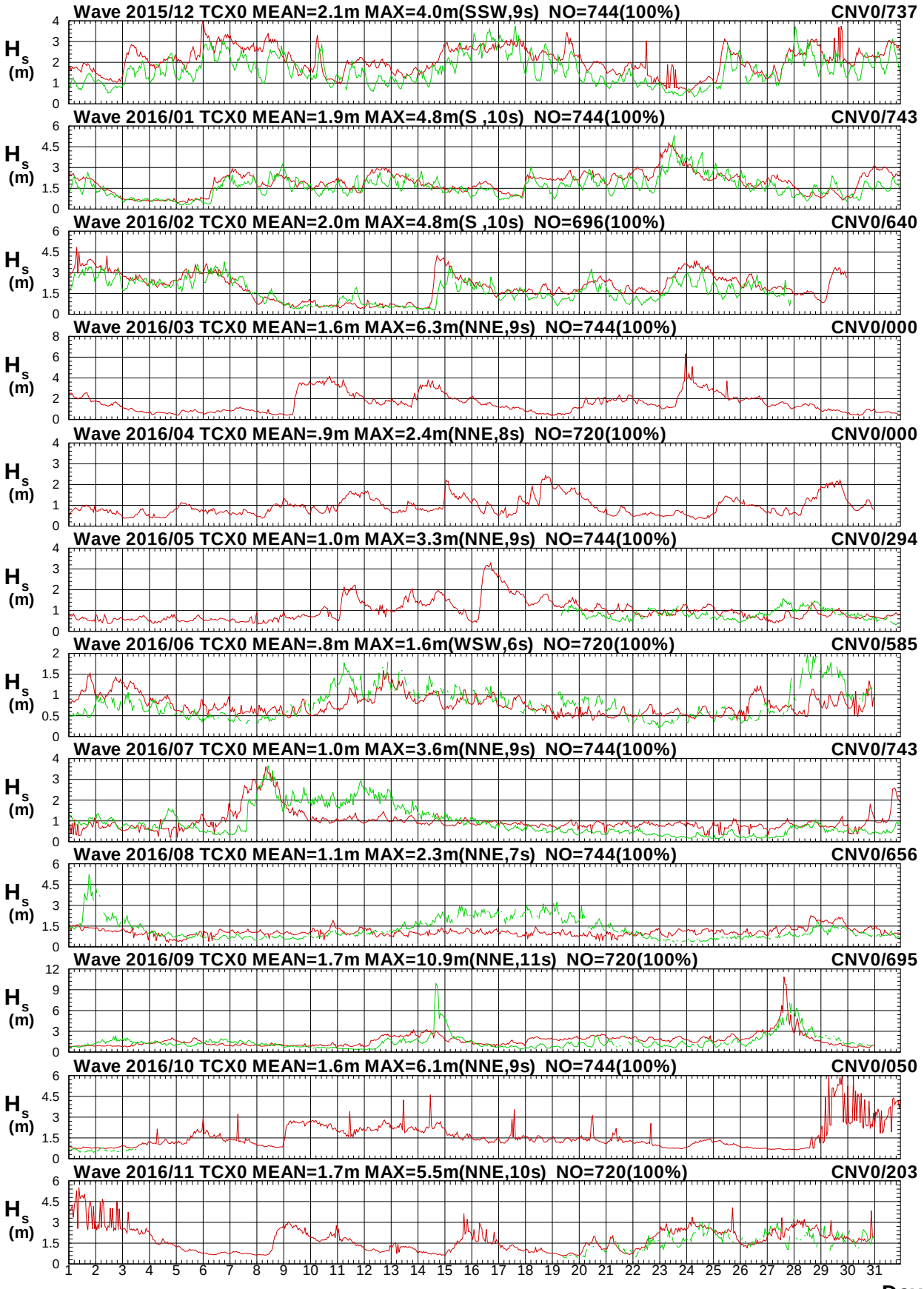

圖 2.11a　2016年每月中雲海域 X 站與嘉南海域 V 站波高圖

V15CTCX0.1HA V15CCNV0.1H0 V161TCX0.1HA V161CNV0.1H0 V162TCX0.1HA V162CNV0.1H0
V163TCX0.1HA V163CNV0.1H0 V164TCX0.1HA V164CNV0.1H0 V165TCX0.1HA V165CNV0.1H0

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Wave T_p in Chung-Yun Seas of TCX0 at 2016

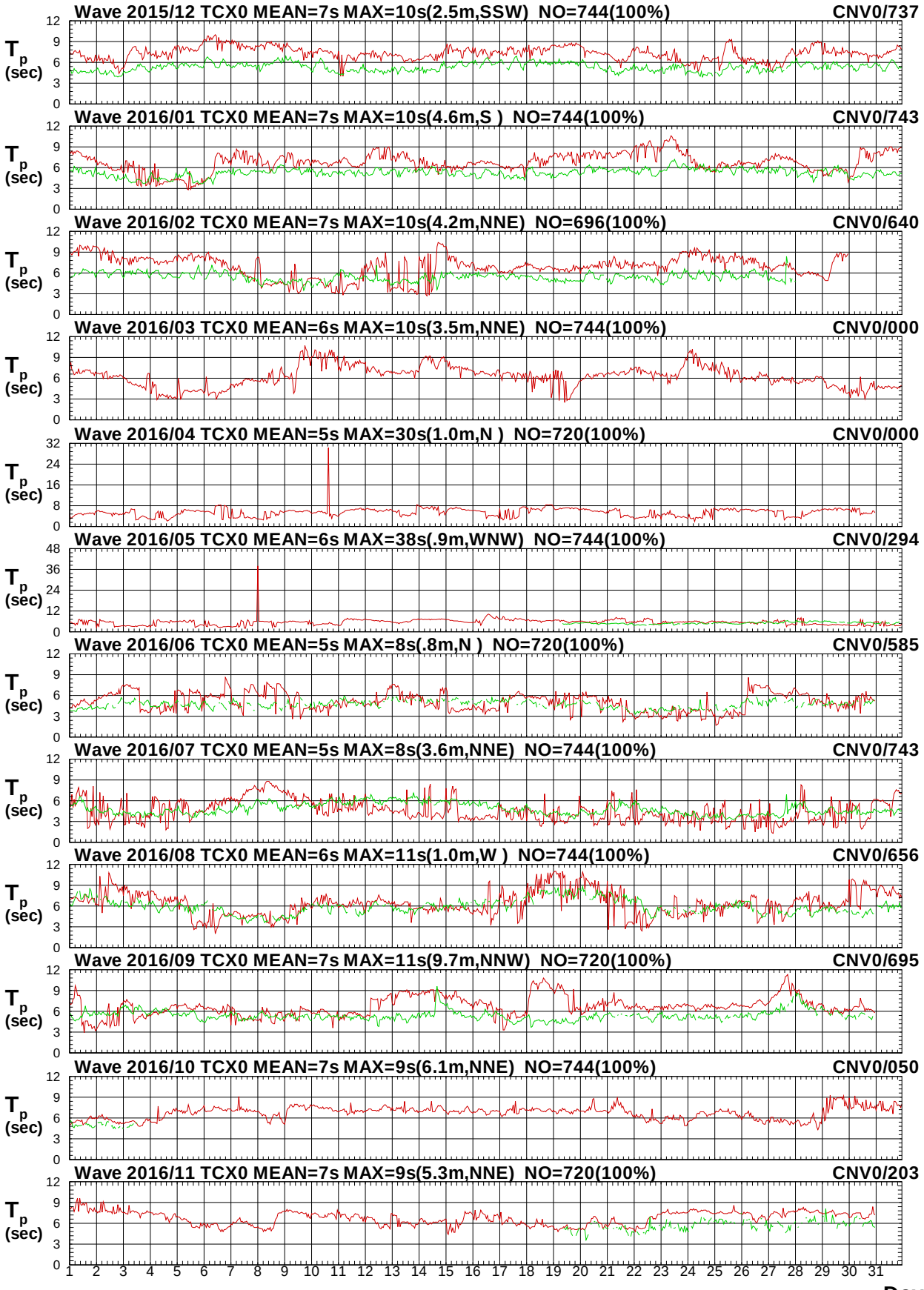

圖 2.11b　2016年每月中雲海域 X 站與嘉南海域 V 站週期圖

V15CTCX0.1HA V15CCNV0.1H0 V161TCX0.1HA V161CNV0.1H0 V162TCX0.1HA V162CNV0.1H0
V163TCX0.1HA V163CNV0.1H0 V164TCX0.1HA V164CNV0.1H0 V165TCX0.1HA V165CNV0.1H0

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Wave Direction in Chung-Yun Seas of TCX0 at 2016

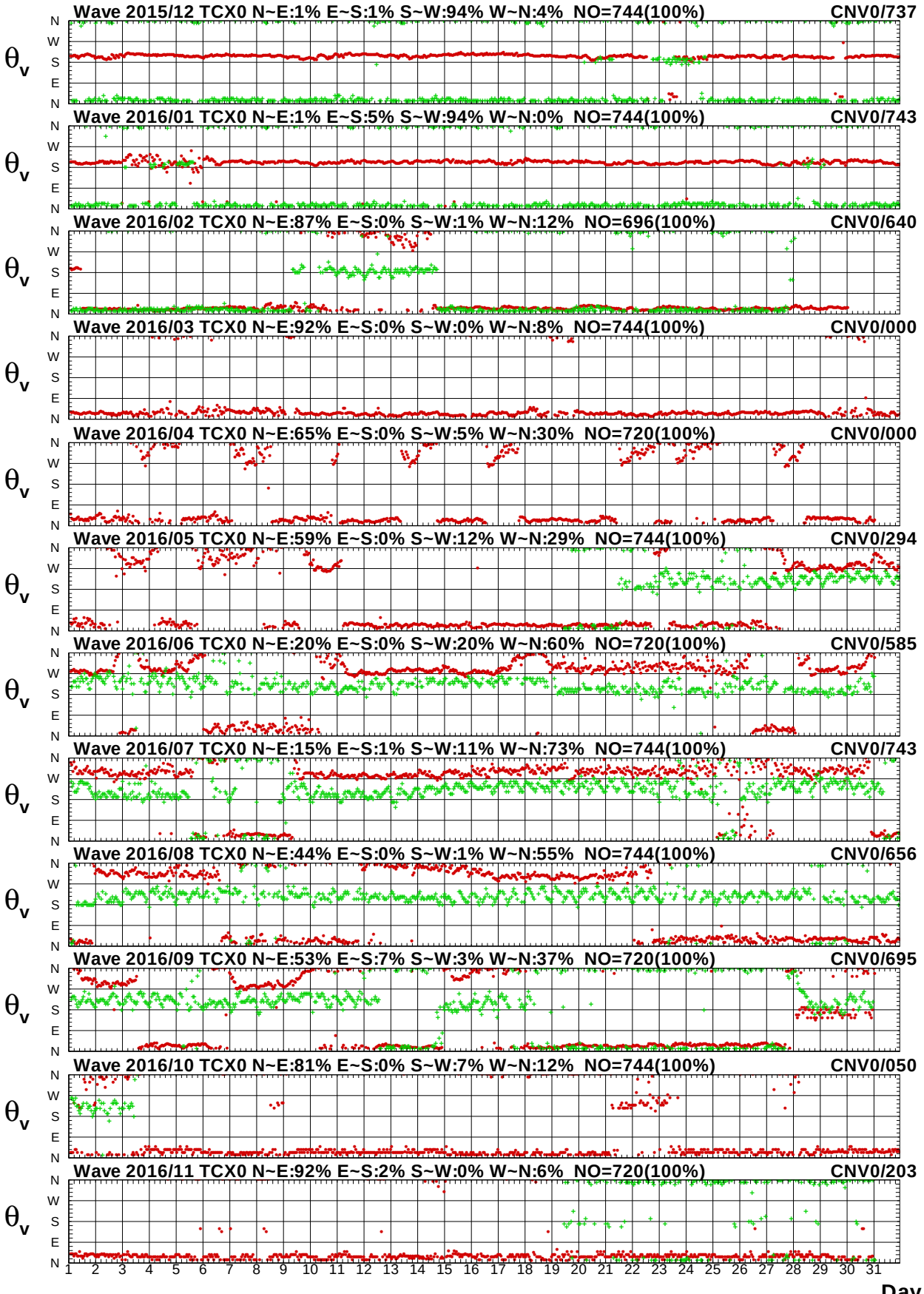

圖2.11c　2016年每月中雲海域 X 站與嘉南海域 V 站波向圖

Wave H_s in Chung-Yun Seas of TCX0 at 2016

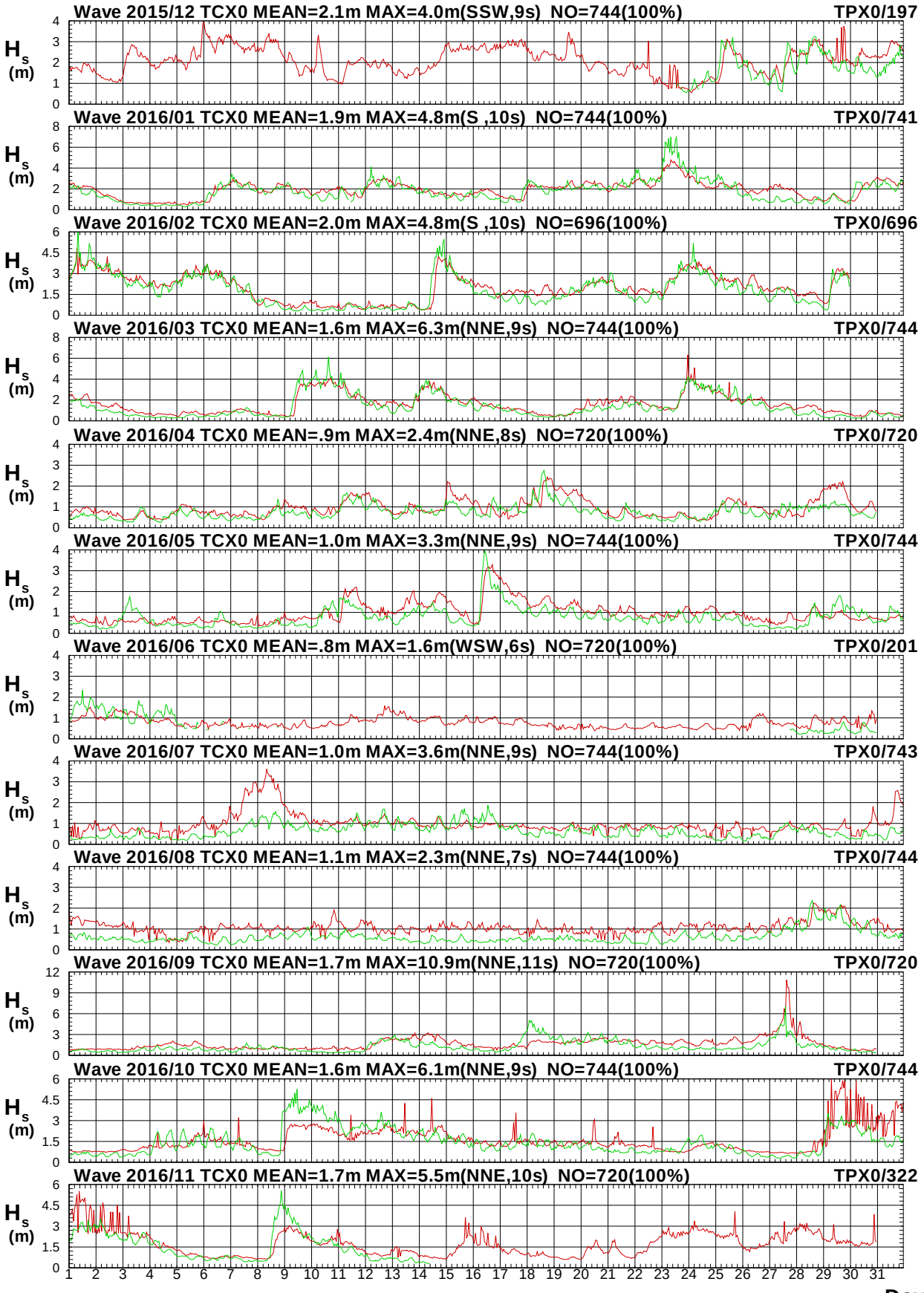

圖 2.12a　2016年每月中雲海域 X 站與北苗海域 X 站波高圖

V15CTCX0.1HA V15CTPX0.1H0 V161TCX0.1HA V161TPX0.1H0 V162TCX0.1HA V162TPX0.1H0
V163TCX0.1HA V163TPX0.1H0 V164TCX0.1HA V164TPX0.1H0 V165TCX0.1HA V165TPX0.1H0

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Wave T_p in Chung-Yun Seas of TCX0 at 2016

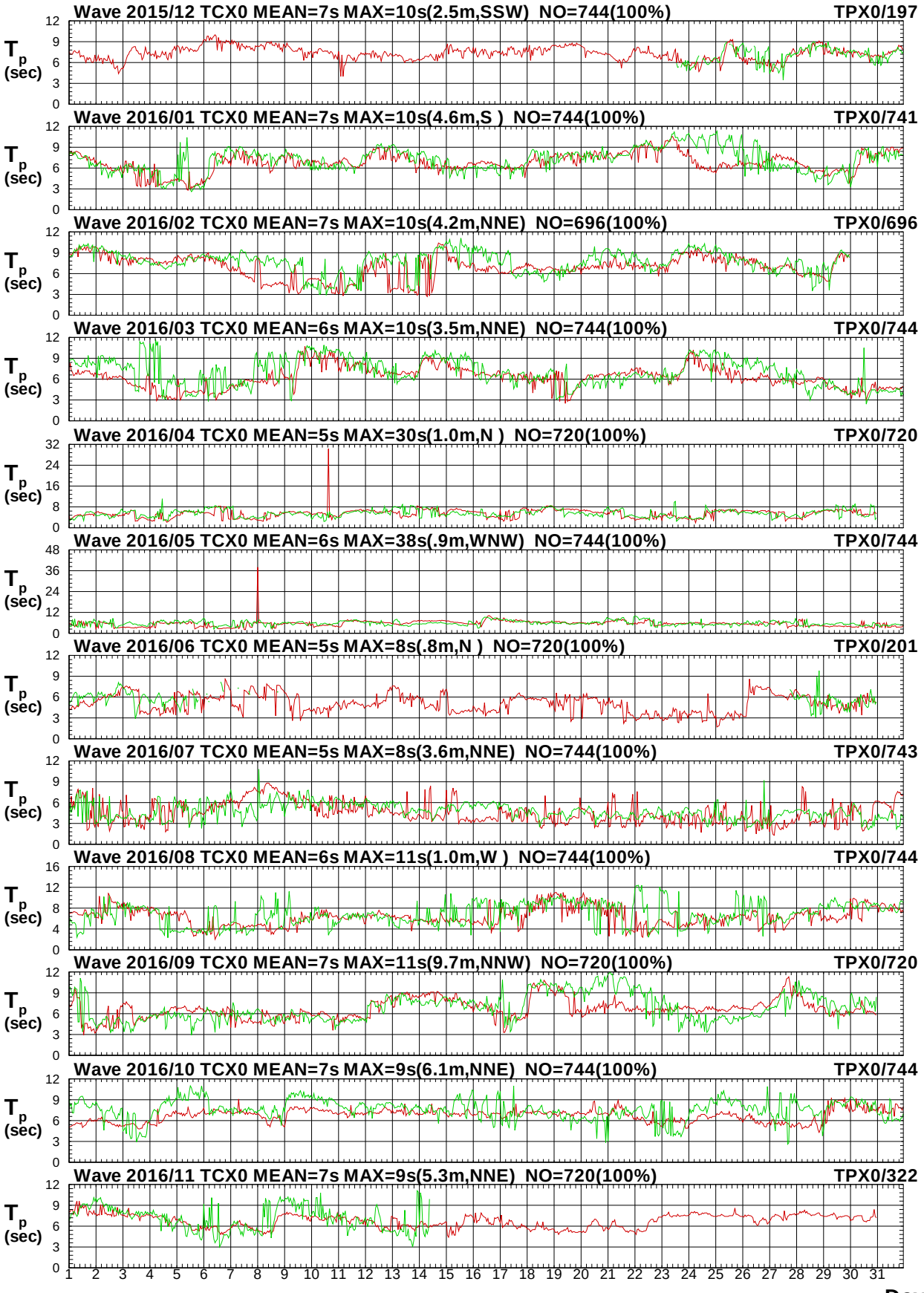

圖 2.12b　2016年每月中雲海域 X 站與北苗海域 X 站週期圖

Wave Direction in Chung-Yun Seas of TCX0 at 2016

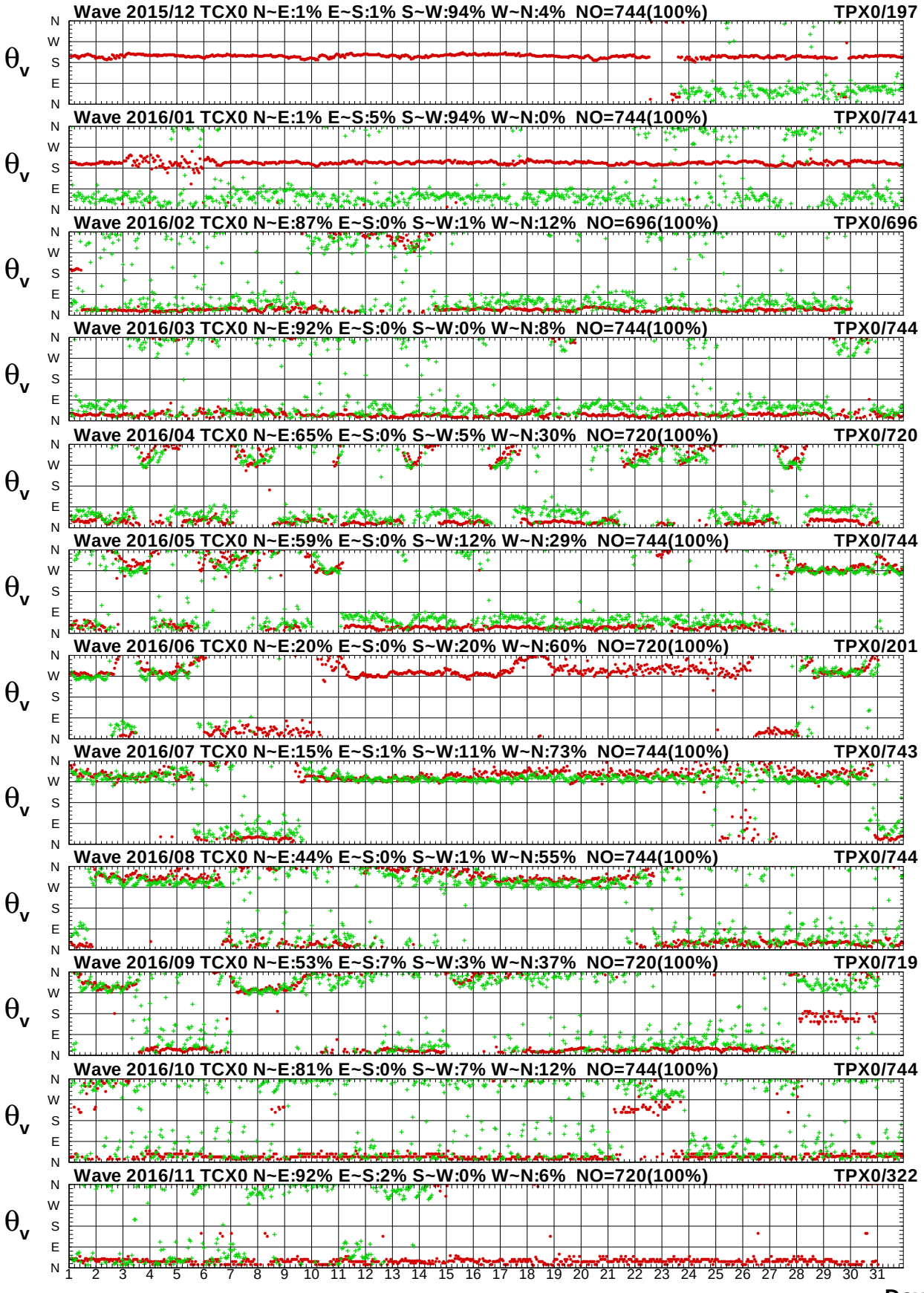

圖2.12c　2016年每月中雲海域 X 站與北苗海域 X 站波向圖

Wave H_s in Chung-Yun Seas of TCX0 at 2016

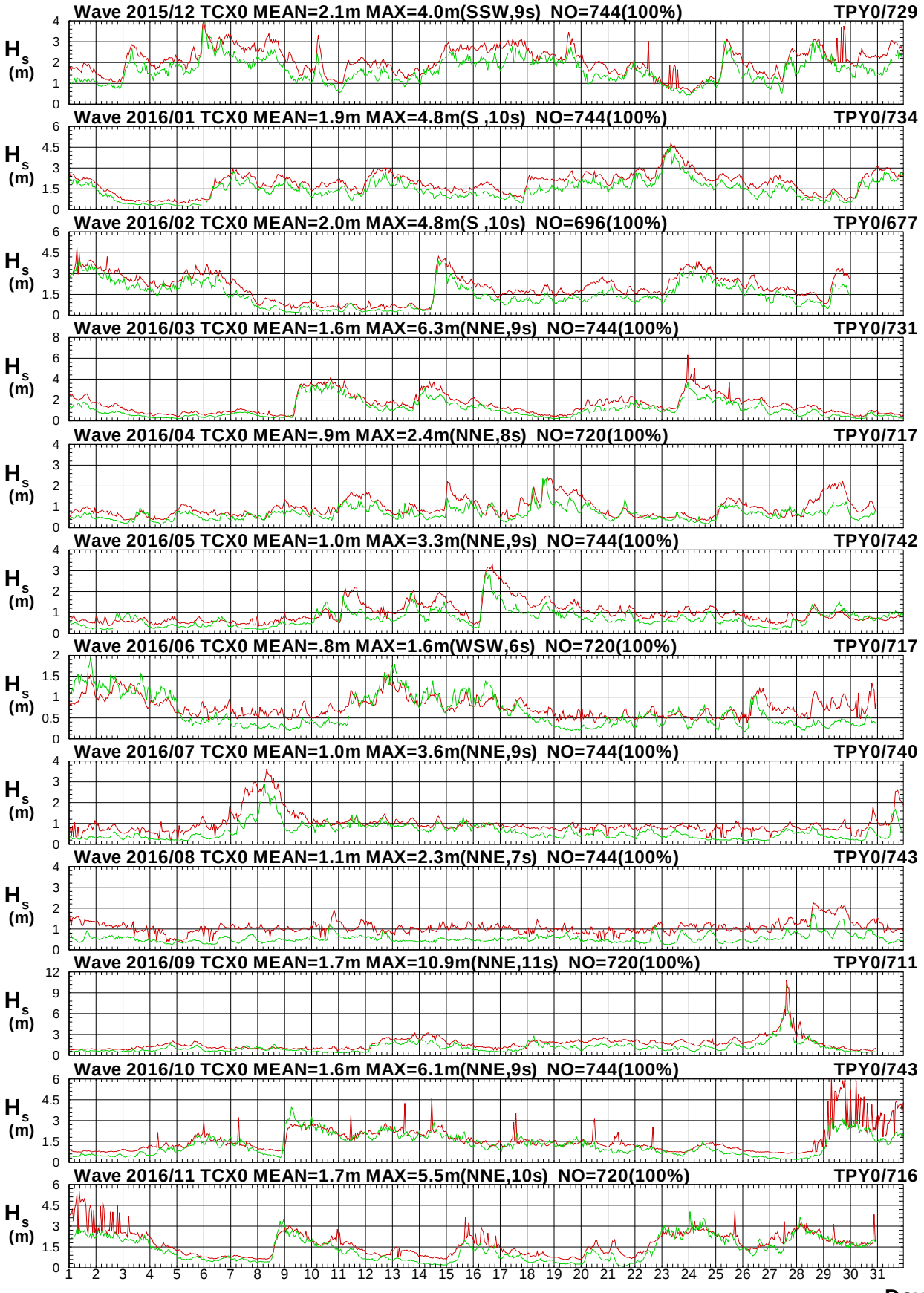

圖 2.13a　2016年每月中雲海域 X 站與北苗海域 Y 站波高圖

V15CTCX0.1HA V15CTPY0.1H0 V161TCX0.1HA V161TPY0.1H0 V162TCX0.1HA V162TPY0.1H0
V163TCX0.1HA V163TPY0.1H0 V164TCX0.1HA V164TPY0.1H0 V165TCX0.1HA V165TPY0.1H0

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Wave T_p in Chung-Yun Seas of TCX0 at 2016

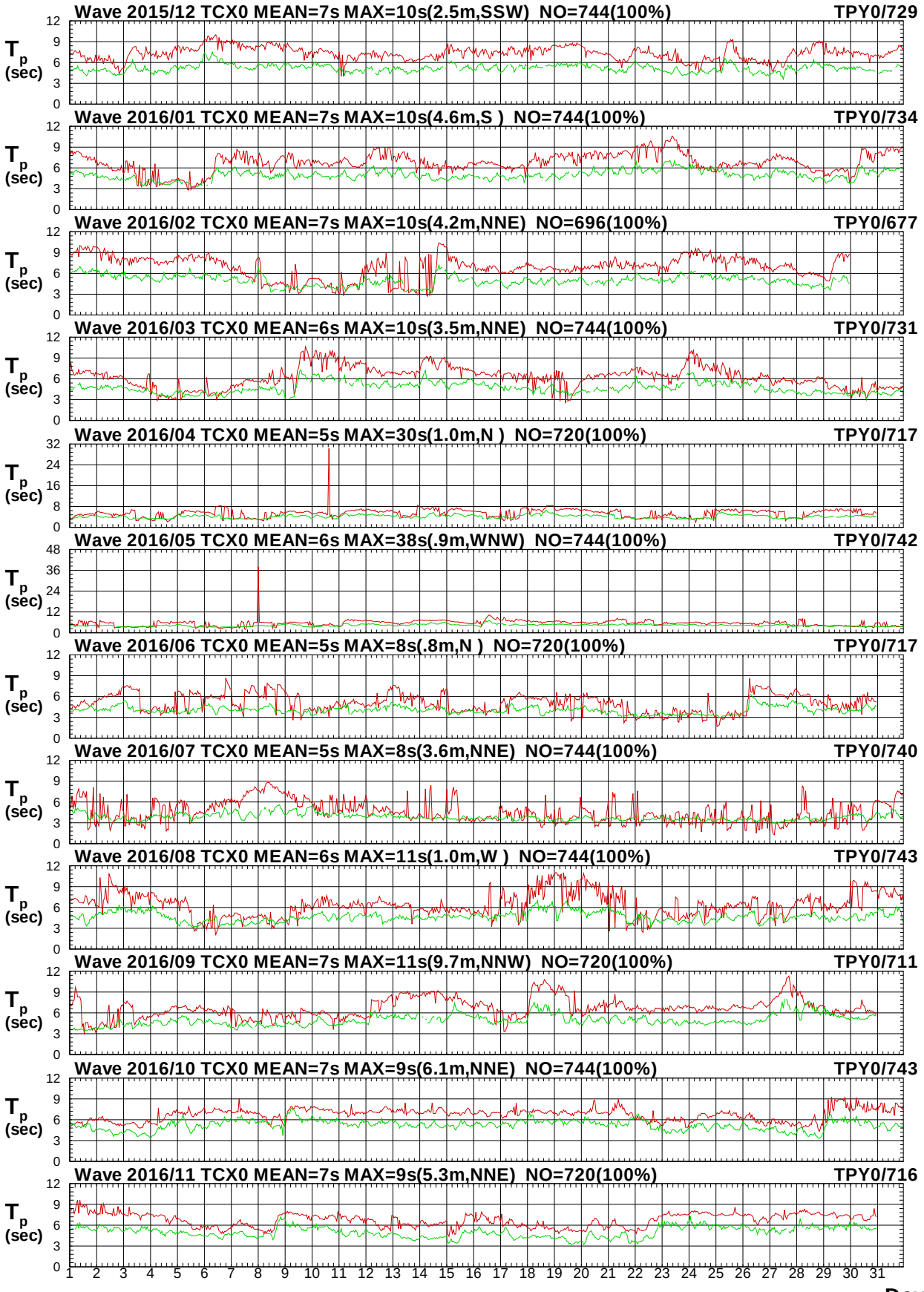

圖 2.13b　2016年每月中雲海域 X 站與北苗海域 Y 站週期圖

V15CTCX0.1HA V15CTPY0.1H0 V161TCX0.1HA V161TPY0.1H0 V162TCX0.1HA V162TPY0.1H0
V163TCX0.1HA V163TPY0.1H0 V164TCX0.1HA V164TPY0.1H0 V165TCX0.1HA V165TPY0.1H0

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Wave Direction in Chung-Yun Seas of TCX0 at 2016

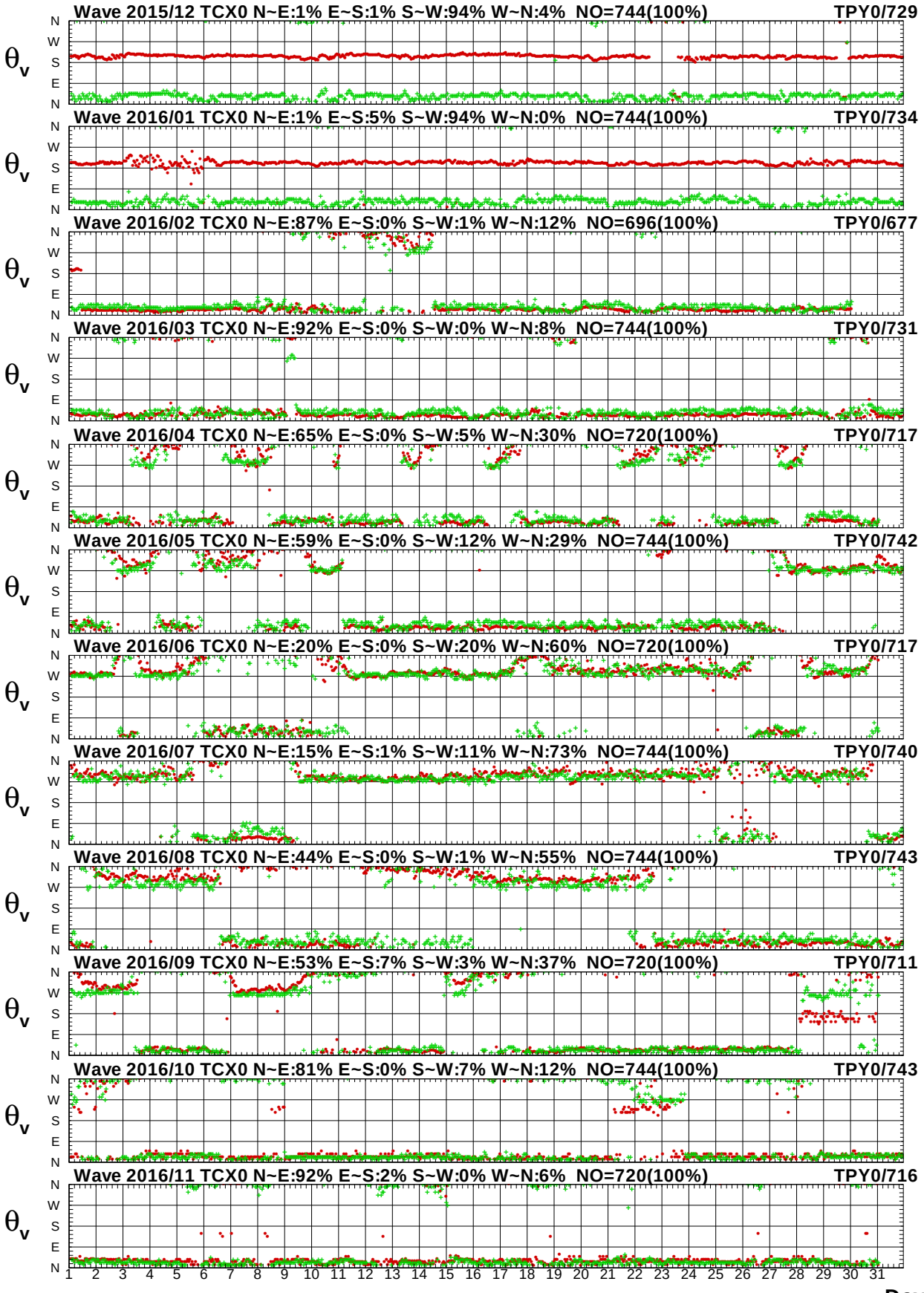

圖2.13c　2016年每月中雲海域 X 站與北苗海域 Y 站波向圖

第三章　2016 年中雲海域觀測潮汐資料

中雲海域潮汐之觀測係於 1981 年 2 月本中心於台中港 4 號碼頭安置潮位站 (**測站 T**) ，位置如附圖 3，1999 年因 921 集集大地震整修 4 號碼頭，將潮位站拆除，2001 年 3 月碼頭整修完成後重新安裝 Water Log 潮位計。另本中心於 2003 年 7 月，在臺中港北防波堤堤頭 150 公尺外、水深 25 公尺處(**測站 X**) 安置 AWCP 監測系統，也具量測水位功能。

潮汐鹿港觀測站(**測站 P**)是由中央氣象局設置。麥寮(**測站 J**)及芳苑(**測站 K**)之潮汐儀則屬水利署所有。中雲海域各測站歷年觀測潮汐資料蒐集概況如表 3。

潮位**測站 X** 潮波流儀，以壓力感測器測得水壓變化時間序列，取樣方式為每一小時取前 10 分鐘之水位變化，取樣頻率為 2Hz，然後加以平均得出該小時之平均水位值。潮位資料之平均水位以觀測水位資料之平均值為基準，未經高程量測，與一般固定式潮位計不同。**測站 T** 潮位資料取樣方式為每 6 分鐘量測一次水位變化。

本潮汐年報以取經檢核或修補後之 **T 站**資料作為**主要觀測站**，2016 年各觀測站修補前每月觀測潮汐資料記錄期間統計表，如表 3.1a，2016 年各觀測站修補後每月觀測潮汐資料記錄期間統計表，如表 3.1b，**主要觀測站修補前後**每月潮汐歷線比較圖，如圖 3.1.1，**主要觀測站**與**調和分析計算潮位**每月潮汐歷線比較圖，如圖 3.1.2，**主要觀測站**與**次要觀測站**每月潮汐歷線比較圖，如圖 3.1.3 以後。

表 3 中雲海域觀測潮汐資料蒐集概況表(統計時間至 2016 年 11 月)

測站	緯度	經度	觀測期間	觀測單位	備註
T	24°17'16"N	120°31'57"E	1989/12-2016/11(觀測中)	港研中心	台中港 4 號碼頭
X0	24°18'04"N	120°28'59"E	1999/10-2000/08	港研中心	北堤外海(延伸前)
X1	24°18'02"N	120°29'05"E	2003/07-2016/11(觀測中)	港研中心	AWCP 北堤外海
J	23°47'09"N	120°09'38"E	2009/01-2016/11(觀測中)	水利署	麥寮潮位站
K			2009/01-2012/02	水利署	芳苑潮位站
P	24°5'6"N	120°25'13"E	2016/03-2016/11(觀測中)	中央氣象局	鹿港潮位站

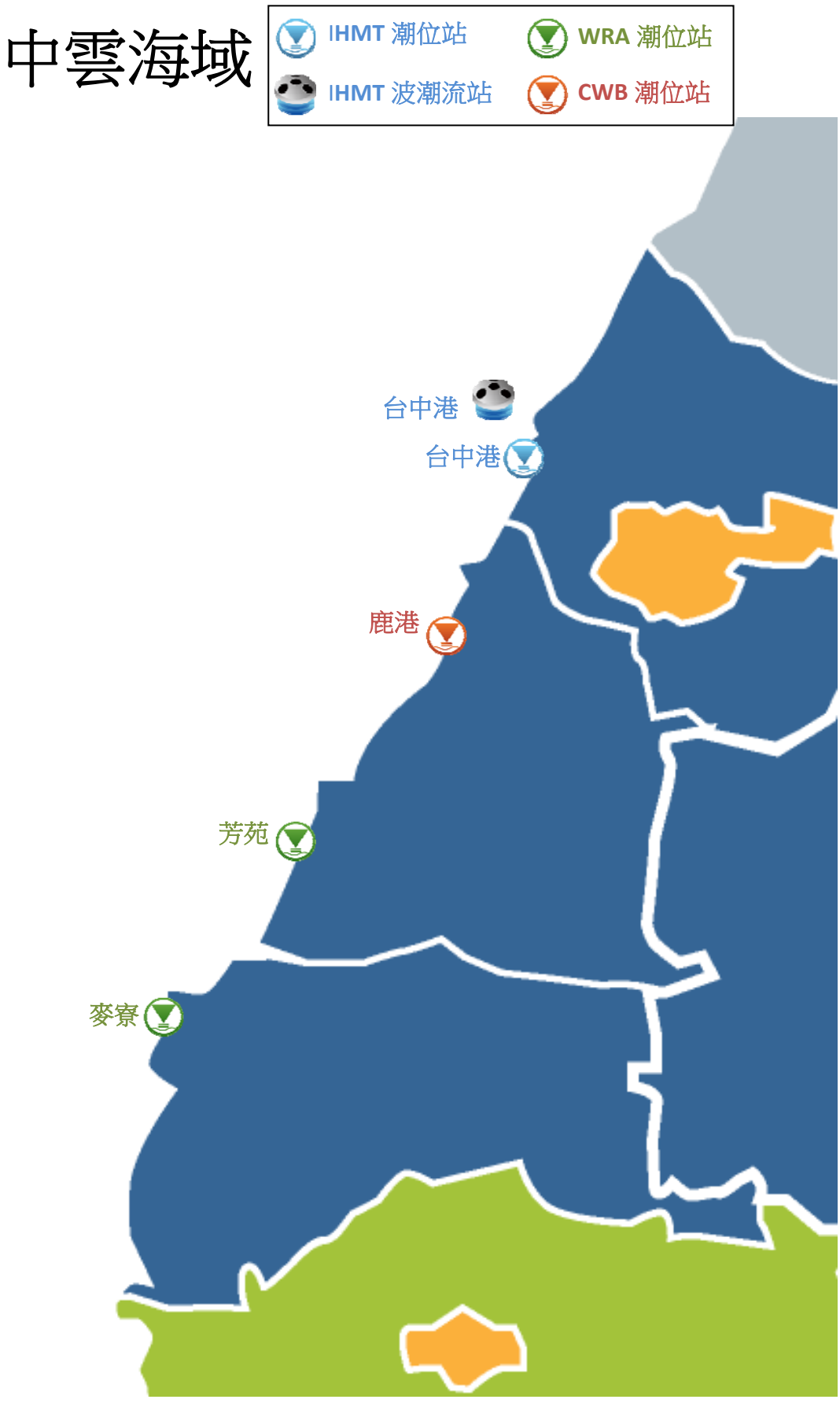

圖 3 中雲海域潮汐觀測站位置示意圖

表3.1a 2016年每月中雲海域修補前各測站觀測潮汐資料紀錄統計表

年/月 港區	臺中海域	臺中海域	臺中海域	臺中海域	臺中海域	臺中海域	臺中海域	臺中海域
測站	T	X	J	K				
2015/12月	744 (100%)	701 (94.2%)	703 (94.5%)	*	*	*	*	*
2016/ 1月	744 (100%)	734 (98.7%)	708 (95.2%)	*	*	*	*	*
2016/ 2月	696 (100%)	694 (99.7%)	659 (94.7%)	*	*	*	*	*
2016/ 3月	744 (100%)	741 (99.6%)	696 (93.5%)	*	*	*	*	*
2016/ 4月	720 (100%)	718 (99.7%)	680 (94.4%)	*	*	*	*	*
2016/ 5月	744 (100%)	735 (98.8%)	711 (95.6%)	*	*	*	*	*
2016/ 6月	720 (100%)	718 (99.7%)	692 (96.1%)	*	*	*	*	*
2016/ 7月	744 (100%)	743 (99.9%)	727 (97.7%)	*	*	*	*	*
2016/ 8月	744 (100%)	719 (96.6%)	722 (97.0%)	*	*	*	*	*
2016/ 9月	717 (99.6%)	629 (87.4%)	693 (96.3%)	*	*	*	*	*
2016/10月	738 (99.2%)	*	708 (95.2%)	*	*	*	*	*
2016/11月	720 (100%)	*	689 (95.7%)	*	*	*	*	*
2016/冬季	*	*	*	*	*	*	*	*
2016/春季	*	*	*	*	*	*	*	*
2016/夏季	*	*	*	*	*	*	*	*
2016/秋季	*	*	*	*	*	*	*	*
2016/整年	*	*	*	*	*	*	*	*
起始年月	*	*	*	*	*	*	*	*
結束年月	*	*	*	*	*	*	*	*

表3.1b 2016年每月中雲海域修補後各測站潮汐資料統計表

年/月 港區	臺中海域	臺中海域	臺中海域	臺中海域	臺中海域	臺中海域	臺中海域	臺中海域
測站	T	X	J	K				
2015/12月	744 (100%)	*	*	*	*	*	*	*
2016/ 1月	744 (100%)	*	*	*	*	*	*	*
2016/ 2月	696 (100%)	*	*	*	*	*	*	*
2016/ 3月	744 (100%)	*	*	*	*	*	*	*
2016/ 4月	720 (100%)	*	*	*	*	*	*	*
2016/ 5月	744 (100%)	*	*	*	*	*	*	*
2016/ 6月	720 (100%)	*	*	*	*	*	*	*
2016/ 7月	744 (100%)	*	*	*	*	*	*	*
2016/ 8月	744 (100%)	*	*	*	*	*	*	*
2016/ 9月	720 (100%)	*	*	*	*	*	*	*
2016/10月	744 (100%)	*	*	*	*	*	*	*
2016/11月	720 (100%)	*	*	*	*	*	*	*
2016/冬季	*	*	*	*	*	*	*	*
2016/春季	*	*	*	*	*	*	*	*
2016/夏季	*	*	*	*	*	*	*	*
2016/秋季	*	*	*	*	*	*	*	*
2016/整年	*	*	*	*	*	*	*	*
起始年月	*	*	*	*	*	*	*	*
結束年月	*	*	*	*	*	*	*	*

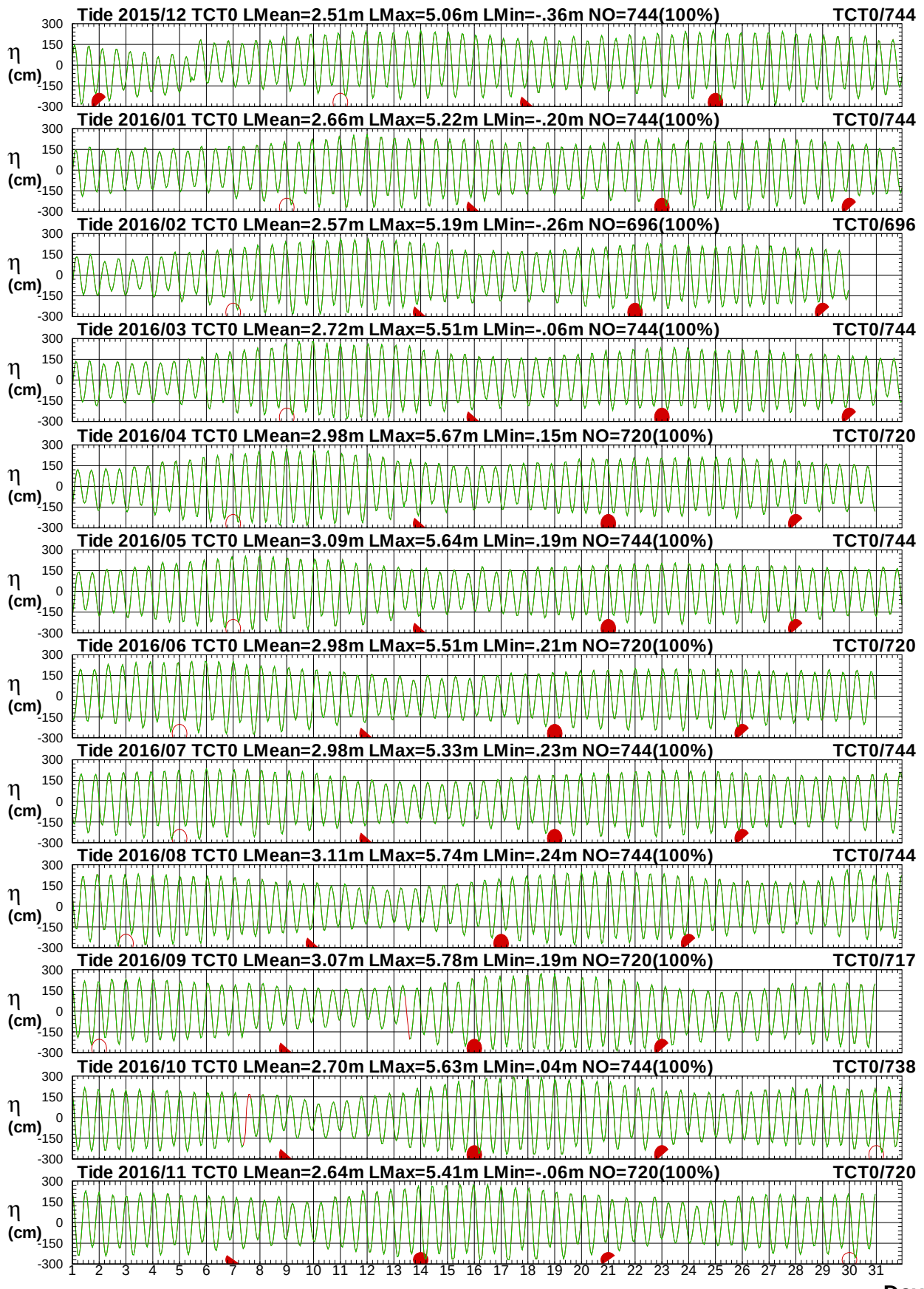

圖 3.1.1　2016年每月中雲海域 T 站修補前後之潮位比較圖

T15CTCT0.1HA T15CTCT0.1H0 T161TCT0.1HA T161TCT0.1H0 T162TCT0.1HA T162TCT0.1H0
T163TCT0.1HA T163TCT0.1H0 T164TCT0.1HA T164TCT0.1H0 T165TCT0.1HA T165TCT0.1H0

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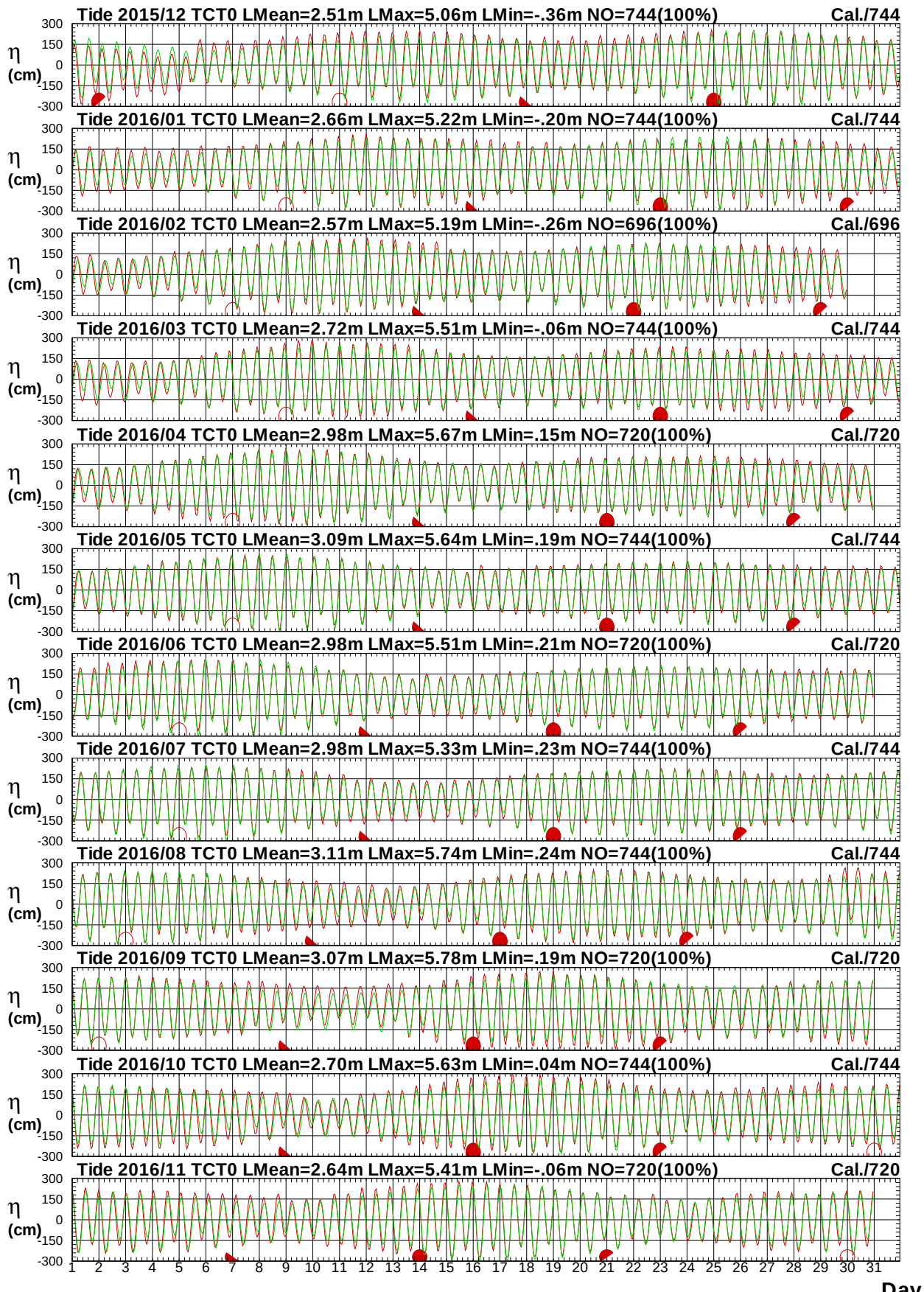

圖 3.1.2　2016年每月中雲海域 T 站潮位歷線圖 (綠線: 天文潮)

T15CTCT0.1HA T15CTCT0.1HC T161TCT0.1HA T161TCT0.1HC T162TCT0.1HA T162TCT0.1HC
T163TCT0.1HA T163TCT0.1HC T164TCT0.1HA T164TCT0.1HC T165TCT0.1HA T165TCT0.1HC

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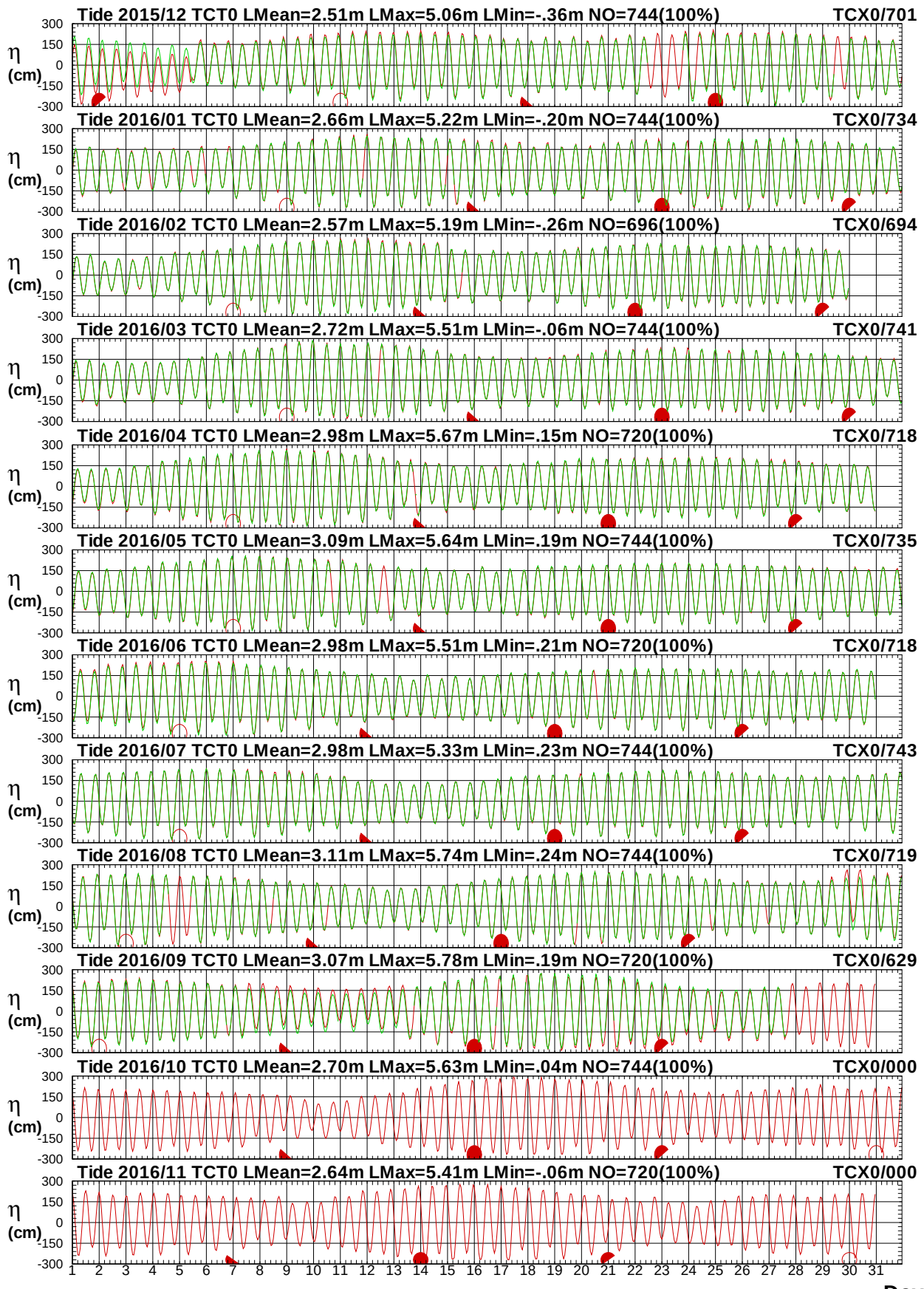

圖 3.1.3　2016年每月中雲海域 T 站與 X 站潮位比較圖

T15CTCT0.1HA T15CTCX0.1H0 T161TCT0.1HA T161TCX0.1H0 T162TCT0.1HA T162TCX0.1H0
T163TCT0.1HA T163TCX0.1H0 T164TCT0.1HA T164TCX0.1H0 T165TCT0.1HA T165TCX0.1H0

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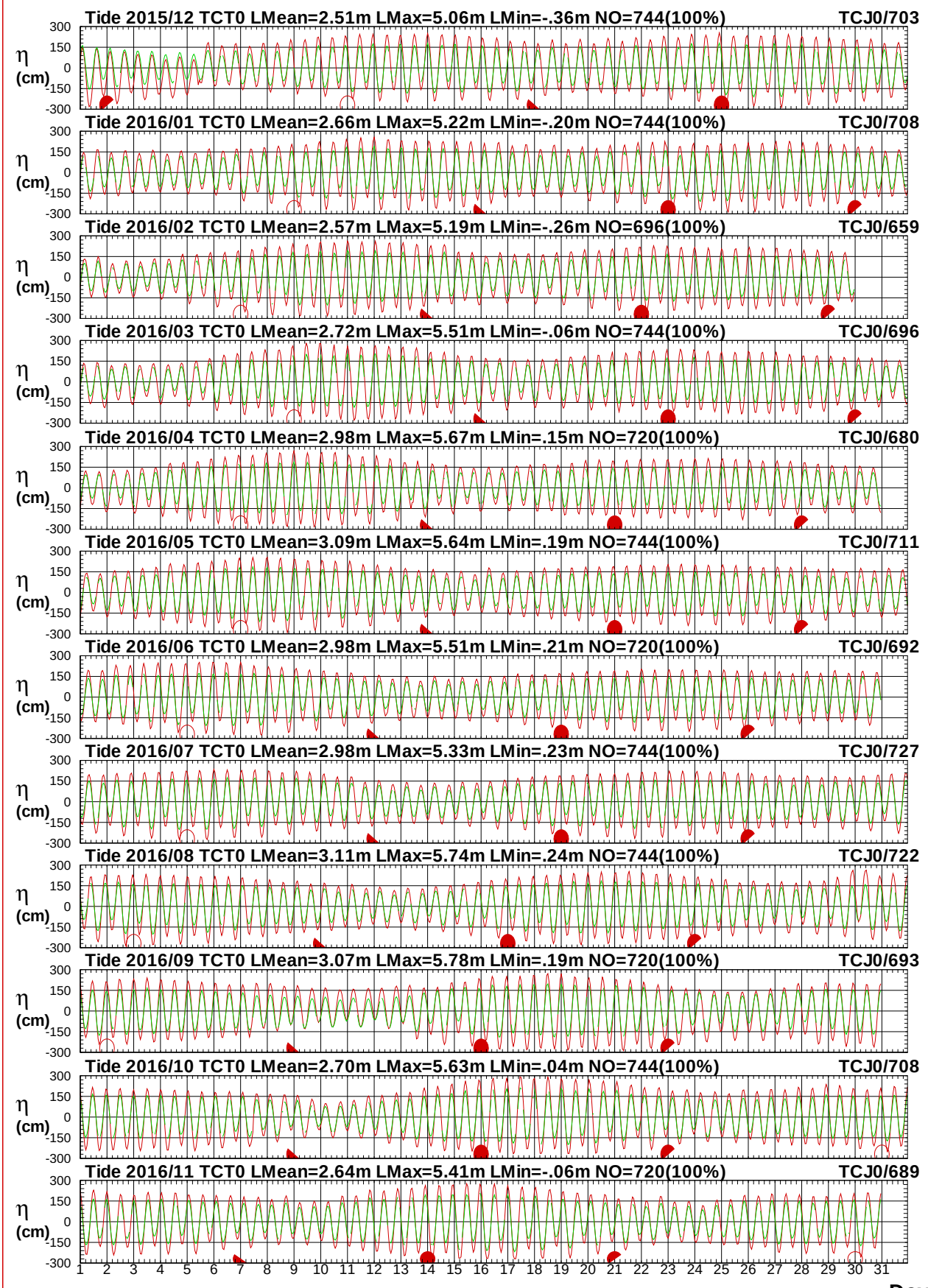

圖 3.1.4　2016年每月中雲海域 T 站與 J 站潮位比較圖

T15CTCT0.1HA T15CTCJ0.1H0 T161TCT0.1HA T161TCJ0.1H0 T162TCT0.1HA T162TCJ0.1H0
T163TCT0.1HA T163TCJ0.1H0 T164TCT0.1HA T164TCJ0.1H0 T165TCT0.1HA T165TCJ0.1H0

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第四章　2016 年中雲海域觀測海流資料

中雲海域(臺中~雲林)海流之觀測本中心**(IHMT)**係於 1999 年 10 月安置挪威 NORTEK 公司表面波浪監測系統於台中港**測站 X0** 處，位置如附圖 4，2000 年因臺中港務局北防波堤延長工程開始展開整平拋石工作影響到儀器安全，於 8 月 18 日暫時停止量測並將設備收回。2003 年 5 月臺中港務局北防波堤延長工程完成後本所隨即在 2003 年 7 月 5 日就安裝完成(NORTEK)波高波向與剖面海流即時傳送監測系統，安裝在臺中港北防波堤堤頭 150 公尺、水深 25 公尺處(稱**測站 X1**)。

測站 Y(彰濱外海浮標站)之海流儀屬海科中心**(TORI)**所設置;**測站 Z**(彰濱外海一浮標站)及**測站 R**(彰濱外海二浮標站)之波浪儀屬中興工程所設置。臺中海域各測站歷年觀測海流資料蒐集概況如表 4。

剖面海流流速的量測可以依照使用在不同水深即自固定在海床上之儀器位置到水表面來設定量測不同的間距，臺中港觀測站水深間距設定為 1 公尺；每小時連續量測 600 秒，再將總和平均代表其數樣每一間距層之海流流速、流向等資料，記錄在感應器內，並每隔 1 小時經由海底電纜傳訊回接收站之電腦中儲存。

本海流年報 2016 年各觀測站每月**觀測海流**資料記錄期間統計表，如表 4.1a，2016 年各觀測站每月**計算潮流**資料統計表，如表 4.1b。2016 年**各觀測站觀測海流**與**計算潮流(殘餘流)**歷線比較圖，**各觀測站觀測海流**與其他測站觀測海流歷線比較圖，如圖 4.1 以後。

表 4 中雲海域觀測海流資料蒐集概況表(統計時間至 2016 年 11 月)

測站	緯度	經度	觀測期間	觀測單位	備註
X0	24°17'54"N	120°29'39"E	1999/10-2000/08	港研中心	北堤外海(延伸前)
X1	24°18'02"N	120°29'05"E	2003/07-2016/11(觀測中)	港研中心	北堤外海
Y	24°01'12"N	120°13'59"E	2012/07-2013/08	海科中心	彰濱外海浮標站
Z	24°06'24"	119°41'33"	2016/09-2016/11(觀測中)	中興工程	彰化外海一浮標
R	24°06'56"	119°51'08"	2016/09-2016/11(觀測中)	中興工程	彰化外海二浮標

圖 4 中雲海域海流觀測站位置示意圖

表4.1a 2016年每月中雲海域各測站觀測海流資料紀錄統計表

年/月 港區	臺中海域	臺中海域	臺中海域	臺中海域	臺中海域	臺中海域	臺中海域	臺中海域
測站	X	Y	R	Z				
2015/12月	702 (94.4%)	490 (65.9%)	*	*	*	*	*	*
2016/ 1月	734 (98.7%)	239 (32.1%)	*	*	*	*	*	*
2016/ 2月	694 (99.7%)	3 (.4%)	*	*	*	*	*	*
2016/ 3月	741 (99.6%)	174 (23.4%)	*	*	*	*	*	*
2016/ 4月	718 (99.7%)	522 (72.5%)	*	*	*	*	*	*
2016/ 5月	735 (98.8%)	462 (62.1%)	*	*	*	*	*	*
2016/ 6月	718 (99.7%)	321 (44.6%)	*	*	*	*	*	*
2016/ 7月	743 (99.9%)	418 (56.2%)	*	*	*	*	*	*
2016/ 8月	719 (96.6%)	307 (41.3%)	*	*	*	*	*	*
2016/ 9月	629 (87.4%)	452 (62.8%)	616 (85.6%)	494 (68.6%)	*	*	*	*
2016/10月	*	563 (75.7%)	649 (87.2%)	629 (84.5%)	*	*	*	*
2016/11月	*	235 (32.6%)	587 (81.5%)	626 (86.9%)	*	*	*	*
2016/冬季	2130 (97.5%)	732 (33.5%)	*	*	*	*	*	*
2016/春季	2194 (99.4%)	1158 (52.4%)	*	*	*	*	*	*
2016/夏季	2180 (98.7%)	1046 (47.4%)	*	*	*	*	*	*
2016/秋季	629 (28.8%)	1250 (57.2%)	1852 (84.8%)	1749 (80.1%)	*	*	*	*
2016/整年	7133 (81.2%)	4186 (47.7%)	1852 (21.1%)	1749 (19.9%)	*	*	*	*
起始年月	2015/12	2015/12	2016/09	2016/09	*	*	*	*
結束年月	2016/09	2016/11	2016/11	2016/11	*	*	*	*

ST-X: 港灣技術研究中心觀測 X 站流速資料

表4.1b 2016年每月中雲海域計算潮流各測站資料統計表

年/月 港區	臺中海域	臺中海域	臺中海域	臺中海域	臺中海域	臺中海域	臺中海域	臺中海域
測站	X	Y	R	Z				
2015/12月	744 (100%)	744 (100%)	744 (100%)	744 (100%)	*	*	*	*
2016/ 1月	744 (100%)	744 (100%)	744 (100%)	744 (100%)	*	*	*	*
2016/ 2月	696 (100%)	696 (100%)	696 (100%)	696 (100%)	*	*	*	*
2016/ 3月	744 (100%)	744 (100%)	744 (100%)	744 (100%)	*	*	*	*
2016/ 4月	720 (100%)	720 (100%)	720 (100%)	720 (100%)	*	*	*	*
2016/ 5月	744 (100%)	744 (100%)	744 (100%)	744 (100%)	*	*	*	*
2016/ 6月	720 (100%)	720 (100%)	720 (100%)	720 (100%)	*	*	*	*
2016/ 7月	744 (100%)	744 (100%)	744 (100%)	744 (100%)	*	*	*	*
2016/ 8月	744 (100%)	744 (100%)	744 (100%)	744 (100%)	*	*	*	*
2016/ 9月	720 (100%)	720 (100%)	720 (100%)	720 (100%)	*	*	*	*
2016/10月	744 (100%)	744 (100%)	744 (100%)	744 (100%)	*	*	*	*
2016/11月	720 (100%)	720 (100%)	720 (100%)	720 (100%)	*	*	*	*
2016/冬季	*	*	*	*	*	*	*	*
2016/春季	*	*	*	*	*	*	*	*
2016/夏季	*	*	*	*	*	*	*	*
2016/秋季	*	*	*	*	*	*	*	*
2016/整年	*	*	*	*	*	*	*	*
起始年月	*	*	*	*	*	*	*	*
結束年月	*	*	*	*	*	*	*	*

Cal.X: 港灣技術研究中心潮流 X 站計算資料

Current Speed in Chung-Yun Seas of TCX0 at 2016

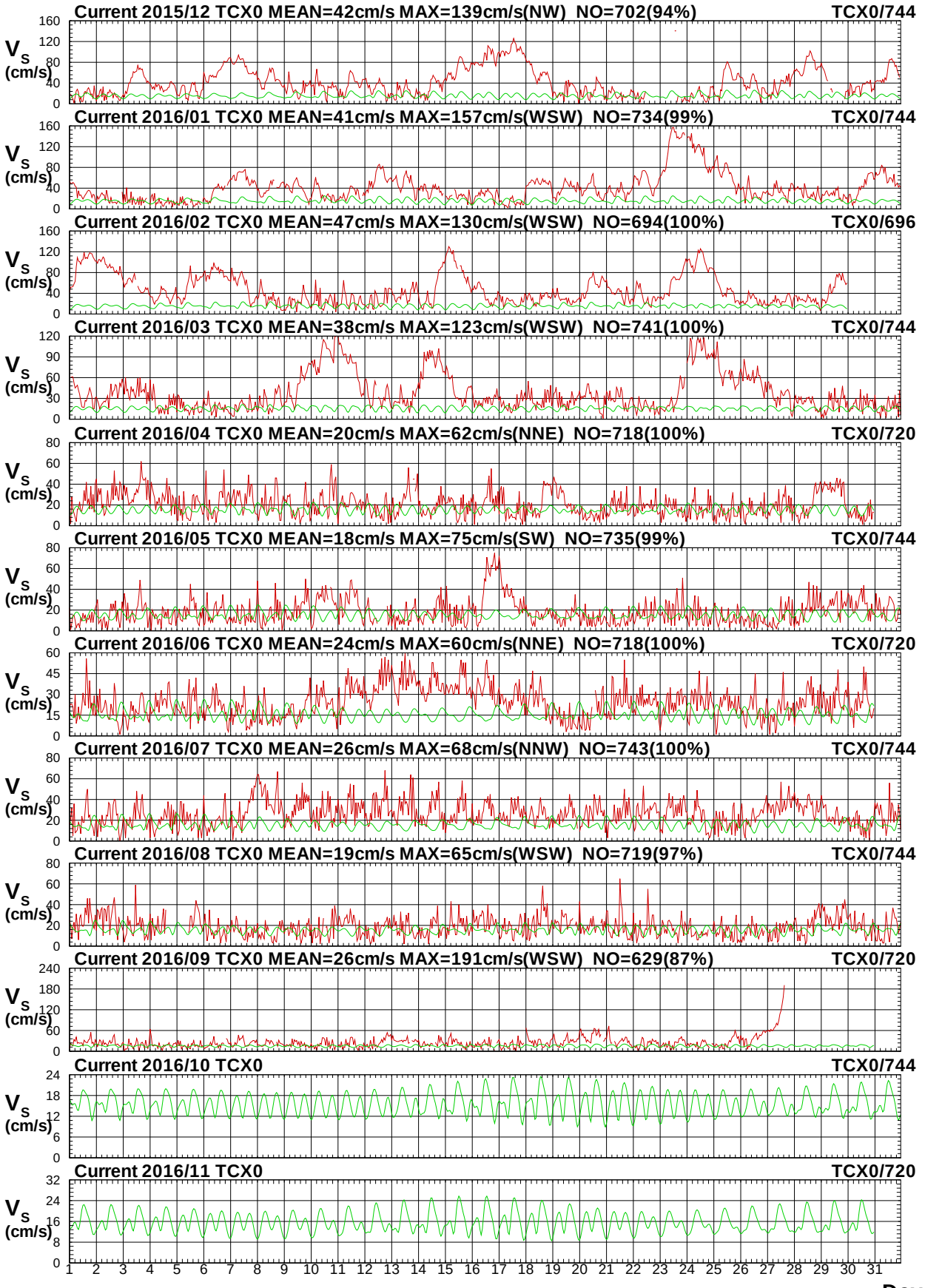

圖 4.1a　2016年每月中雲海域 X 站觀測與潮流流速比較圖

C15CTCX0.1H0 C15CTCX0.1HD C161TCX0.1H0 C161TCX0.1HD C162TCX0.1H0 C162TCX0.1HD
C163TCX0.1H0 C163TCX0.1HD C164TCX0.1H0 C164TCX0.1HD C165TCX0.1H0 C165TCX0.1HD

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Current Direction in Chung-Yun Seas of TCX0 at 2016

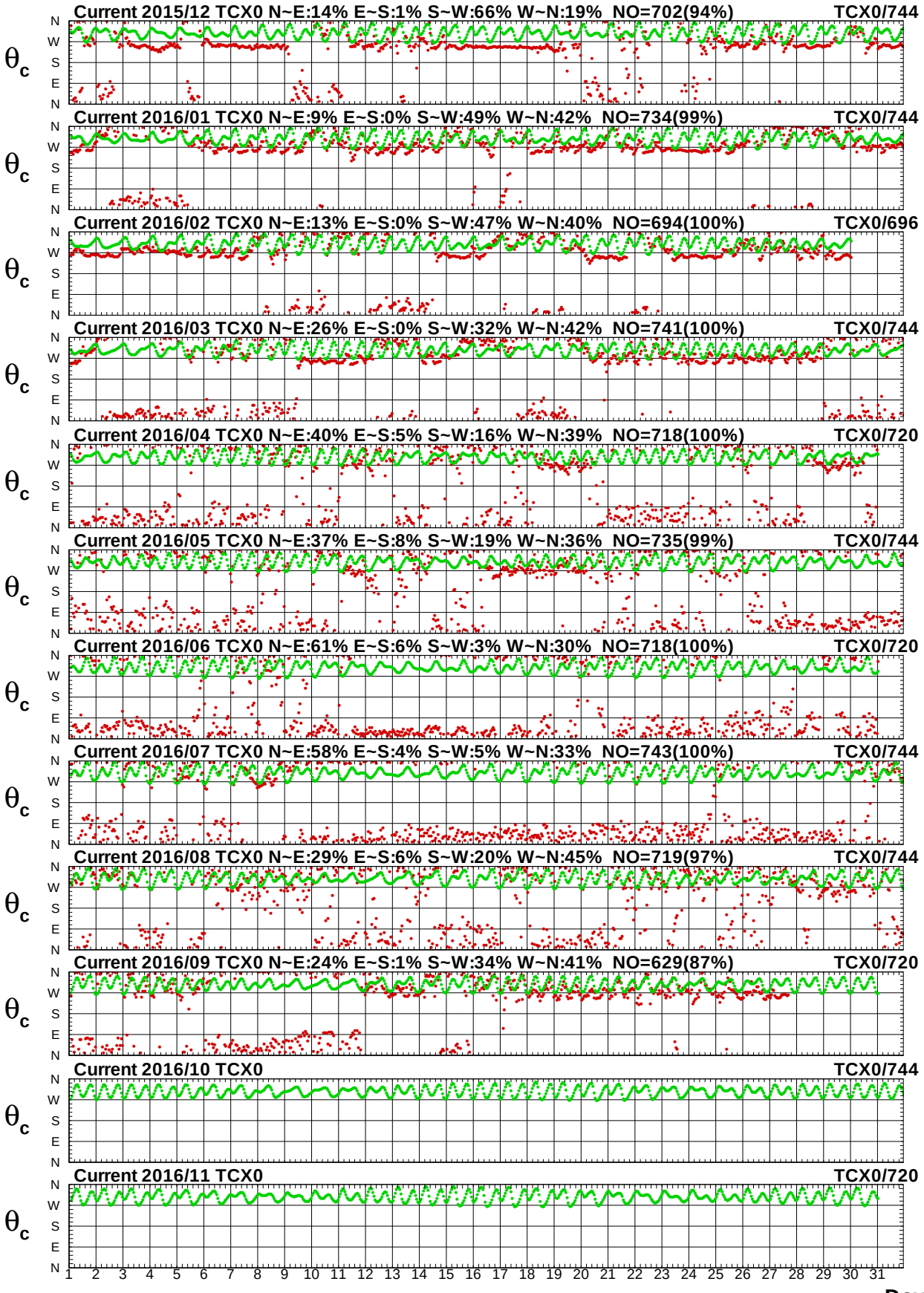

圖4.1b　2016年每月中雲海域 X 站觀測與潮流流向比較圖

Current Speed in Chung-Yun Seas of TCX0 at 2016

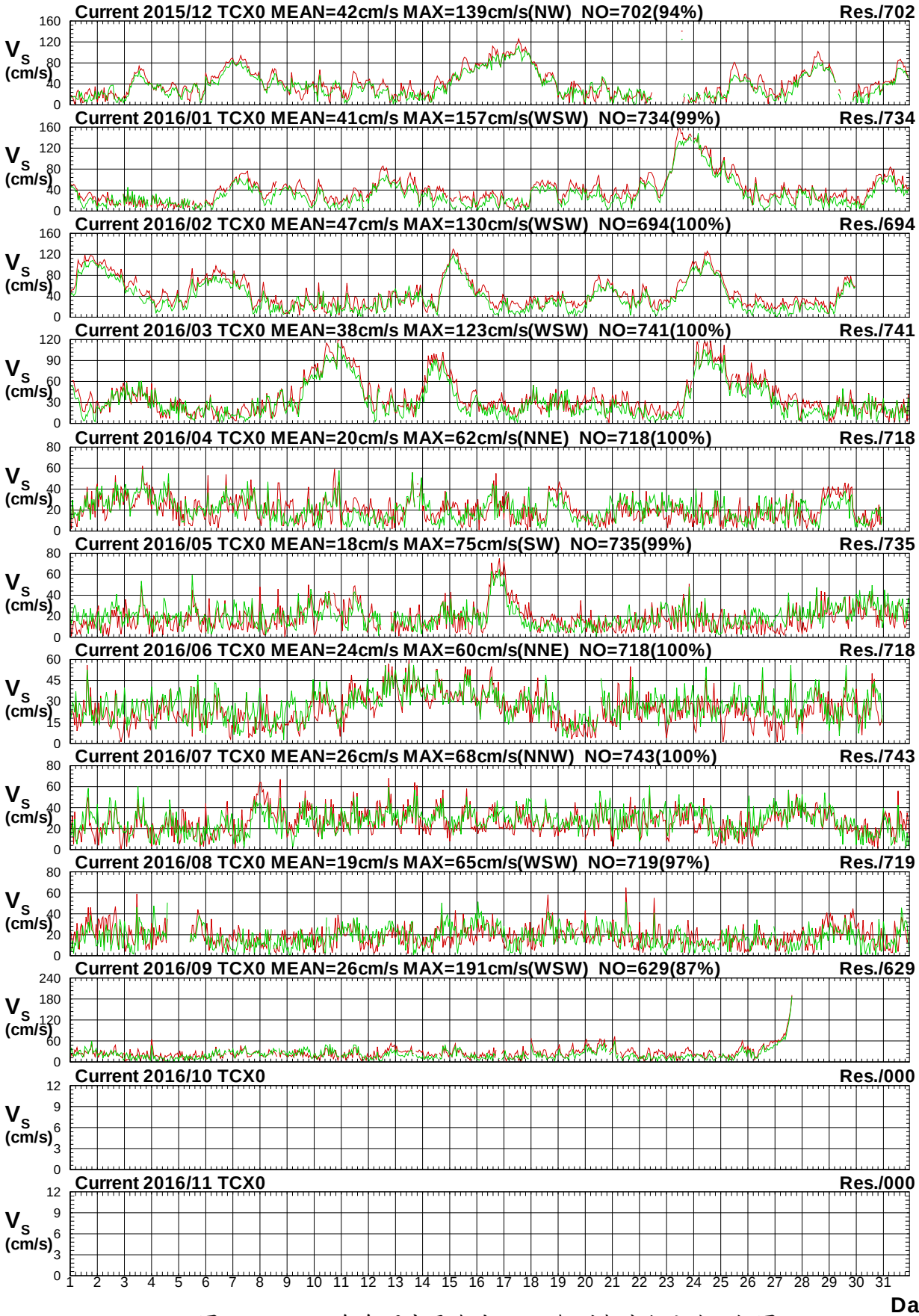

圖 4.2a　2016年每月中雲海域 X 站觀測與非潮流速比較圖

C15CTCX0.1H0 C15CTCX0.1HR C161TCX0.1H0 C161TCX0.1HR C162TCX0.1H0 C162TCX0.1HR
C163TCX0.1H0 C163TCX0.1HR C164TCX0.1H0 C164TCX0.1HR C165TCX0.1H0 C165TCX0.1HR

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Current Direction in Chung-Yun Seas of TCX0 at 2016

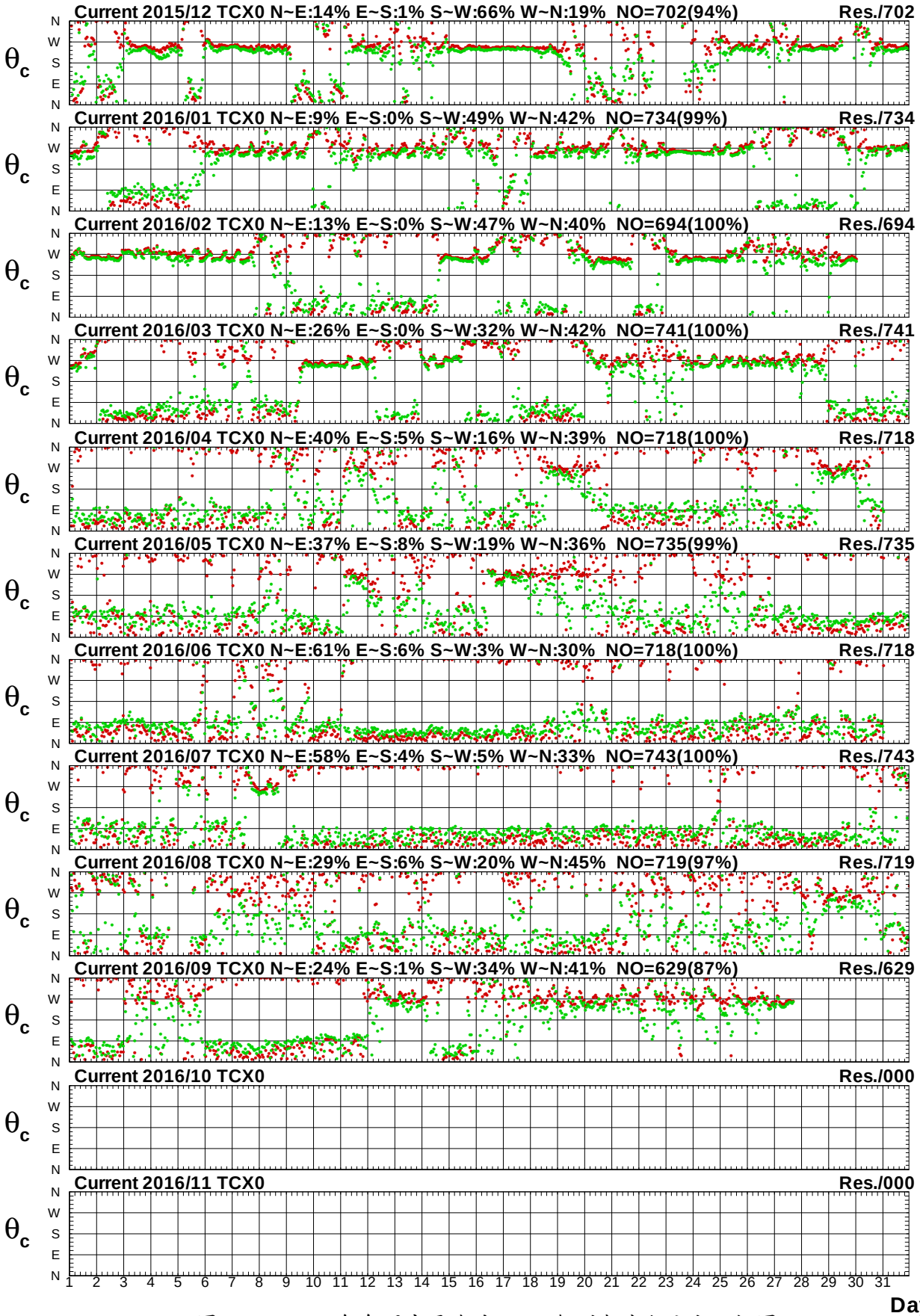

圖4.2b　2016年每月中雲海域 X 站觀測與非潮流向比較圖

Current Speed in Chung-Yun Seas of TCY0 at 2016

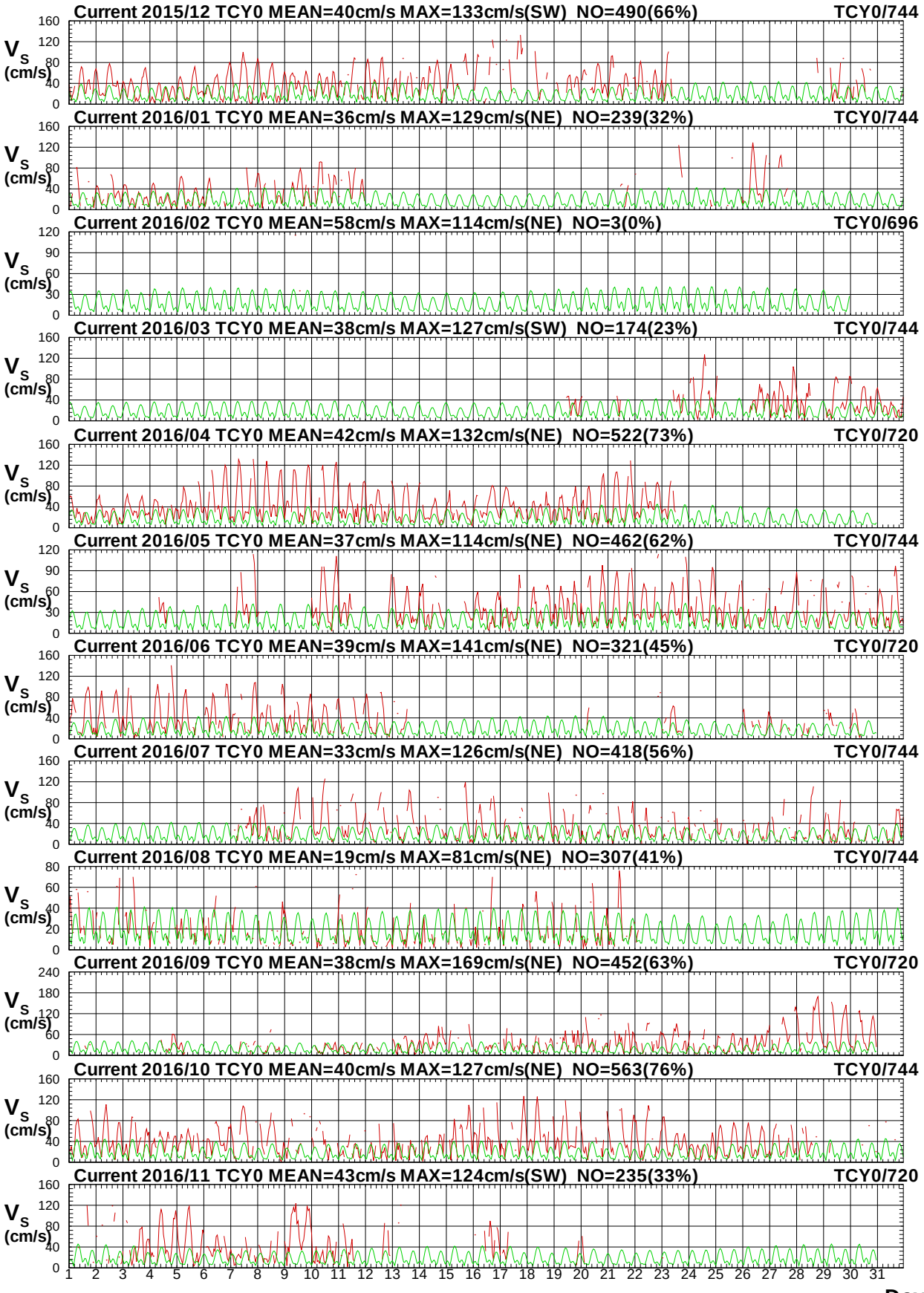

圖 4.3a　2016年每月中雲海域 Y 站觀測與潮流流速比較圖

C15CTCY0.1H0 C15CTCY0.1HD C161TCY0.1H0 C161TCY0.1HD C162TCY0.1H0 C162TCY0.1HD
C163TCY0.1H0 C163TCY0.1HD C164TCY0.1H0 C164TCY0.1HD C165TCY0.1H0 C165TCY0.1HD

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Current Direction in Chung-Yun Seas of TCY0 at 2016

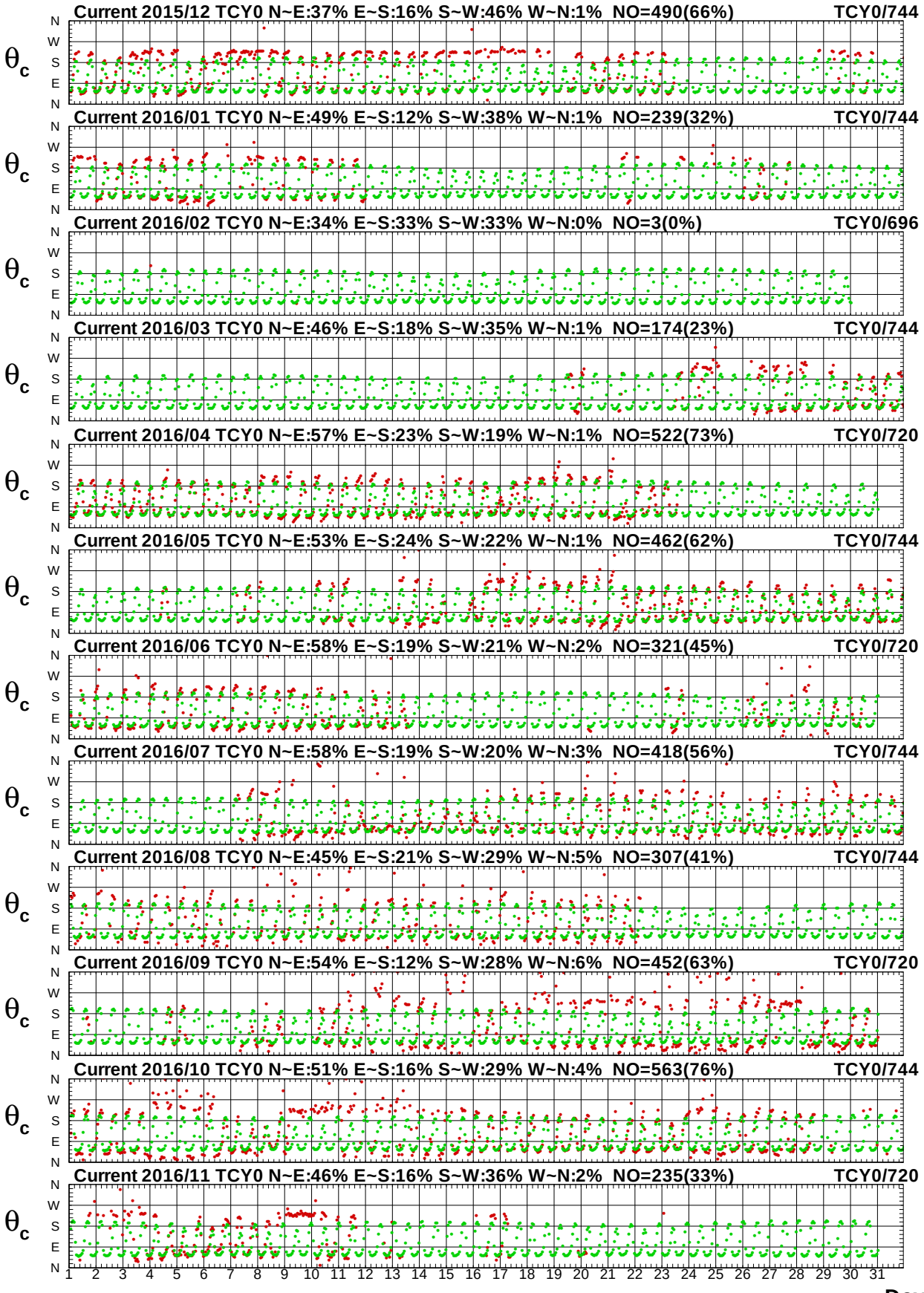

圖 4.3b　2016年每月中雲海域 Y 站觀測與潮流流向比較圖

C15CTCY0.1H0 C15CTCY0.1HD C161TCY0.1H0 C161TCY0.1HD C162TCY0.1H0 C162TCY0.1HD
C163TCY0.1H0 C163TCY0.1HD C164TCY0.1H0 C164TCY0.1HD C165TCY0.1H0 C165TCY0.1HD

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Current Speed in Chung-Yun Seas of TCY0 at 2016

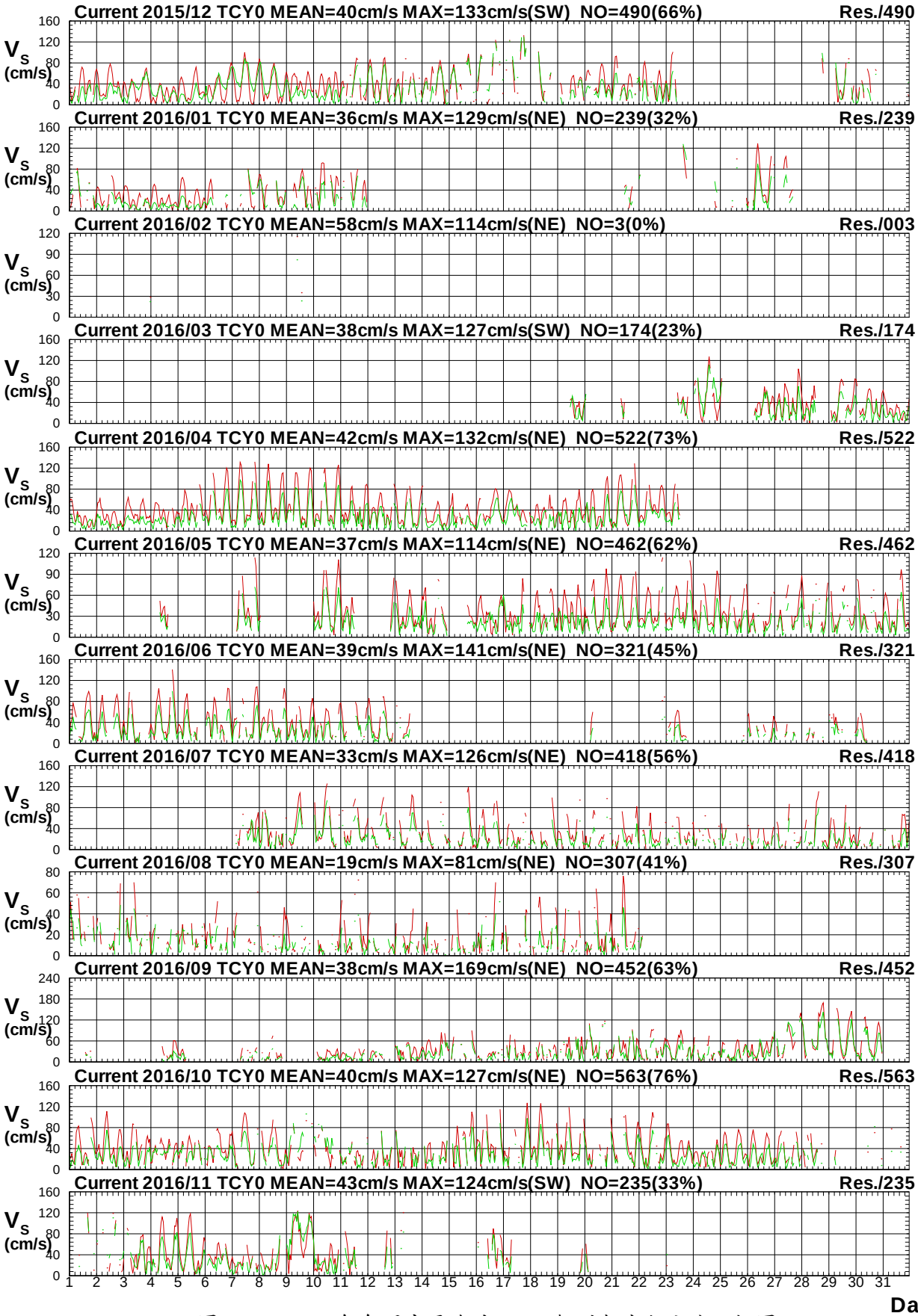

圖 4.4a　2016年每月中雲海域 Y 站觀測與非潮流速比較圖

C15CTCY0.1H0 C15CTCY0.1HR C161TCY0.1H0 C161TCY0.1HR C162TCY0.1H0 C162TCY0.1HR
C163TCY0.1H0 C163TCY0.1HR C164TCY0.1H0 C164TCY0.1HR C165TCY0.1H0 C165TCY0.1HR

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Current Direction in Chung-Yun Seas of TCY0 at 2016

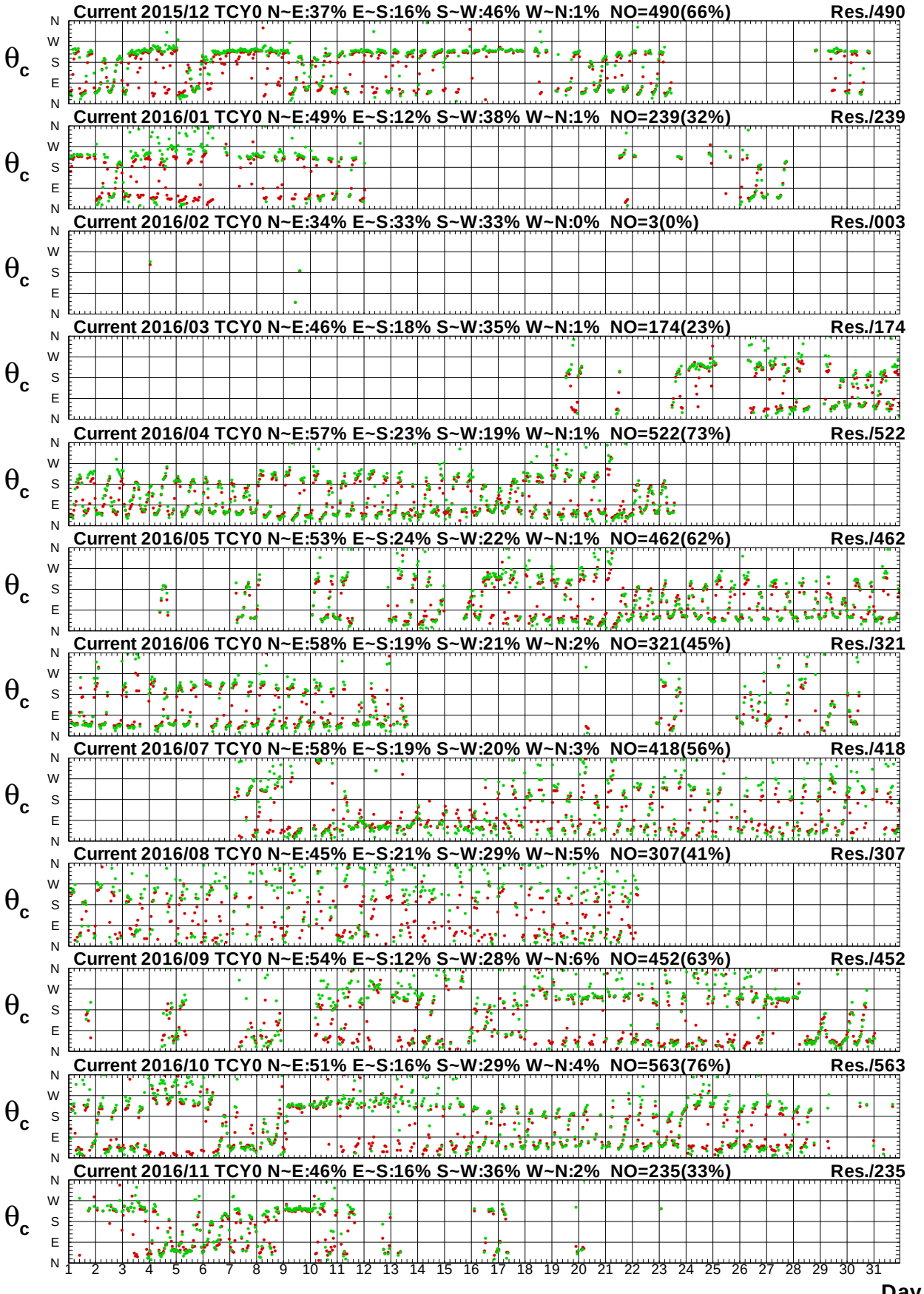

圖4.4b　2016年每月中雲海域 Y 站觀測與非潮流向比較圖

Current Speed in Chung-Yun Seas of TCZ0 at 2016

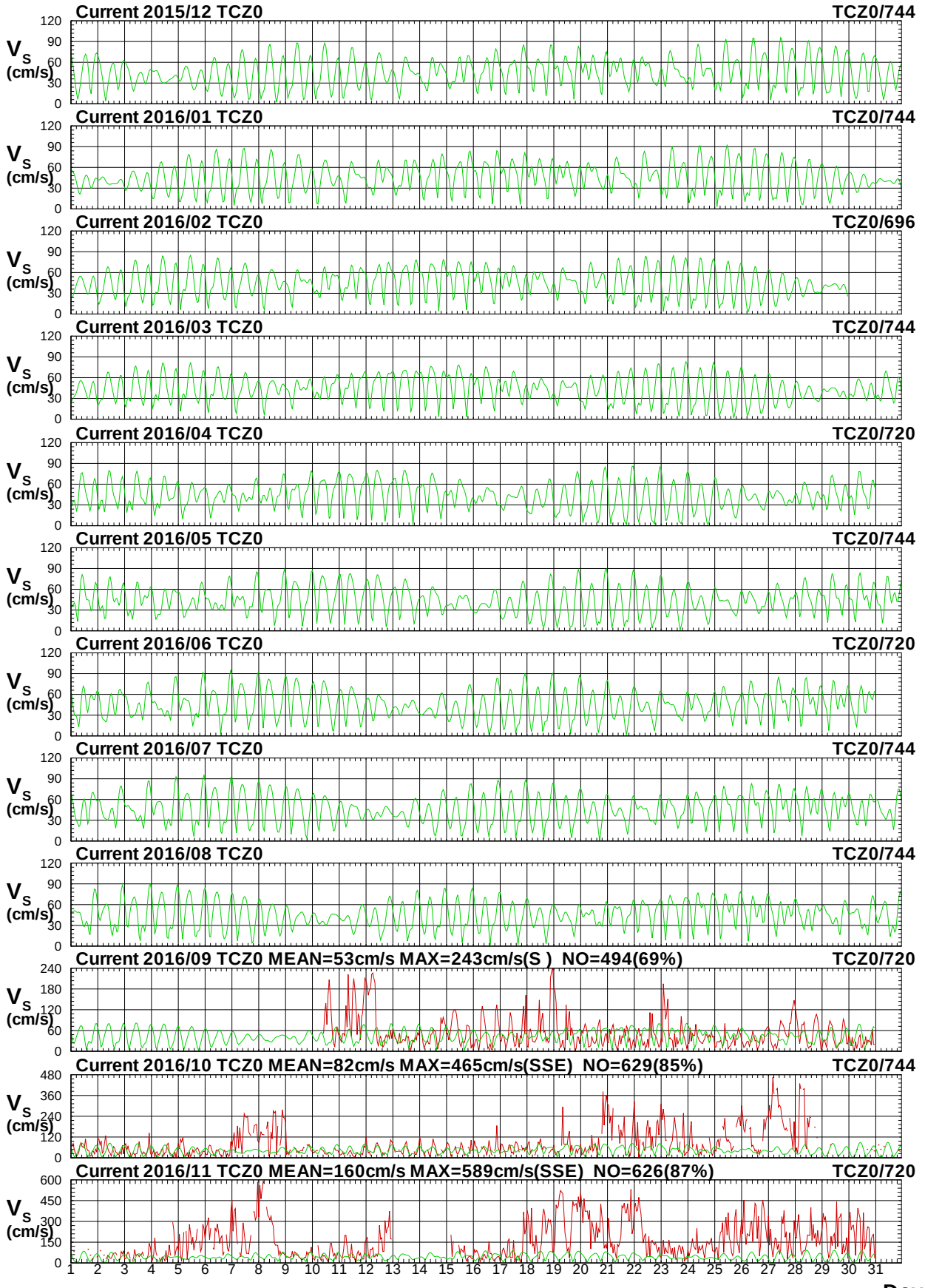

圖 4.5a　2016年每月中雲海域 Z 站觀測與潮流流速比較圖

C15CTCZ0.1H0 C15CTCZ0.1HD C161TCZ0.1H0 C161TCZ0.1HD C162TCZ0.1H0 C162TCZ0.1HD
C163TCZ0.1H0 C163TCZ0.1HD C164TCZ0.1H0 C164TCZ0.1HD C165TCZ0.1H0 C165TCZ0.1HD

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Current Direction in Chung-Yun Seas of TCZ0 at 2016

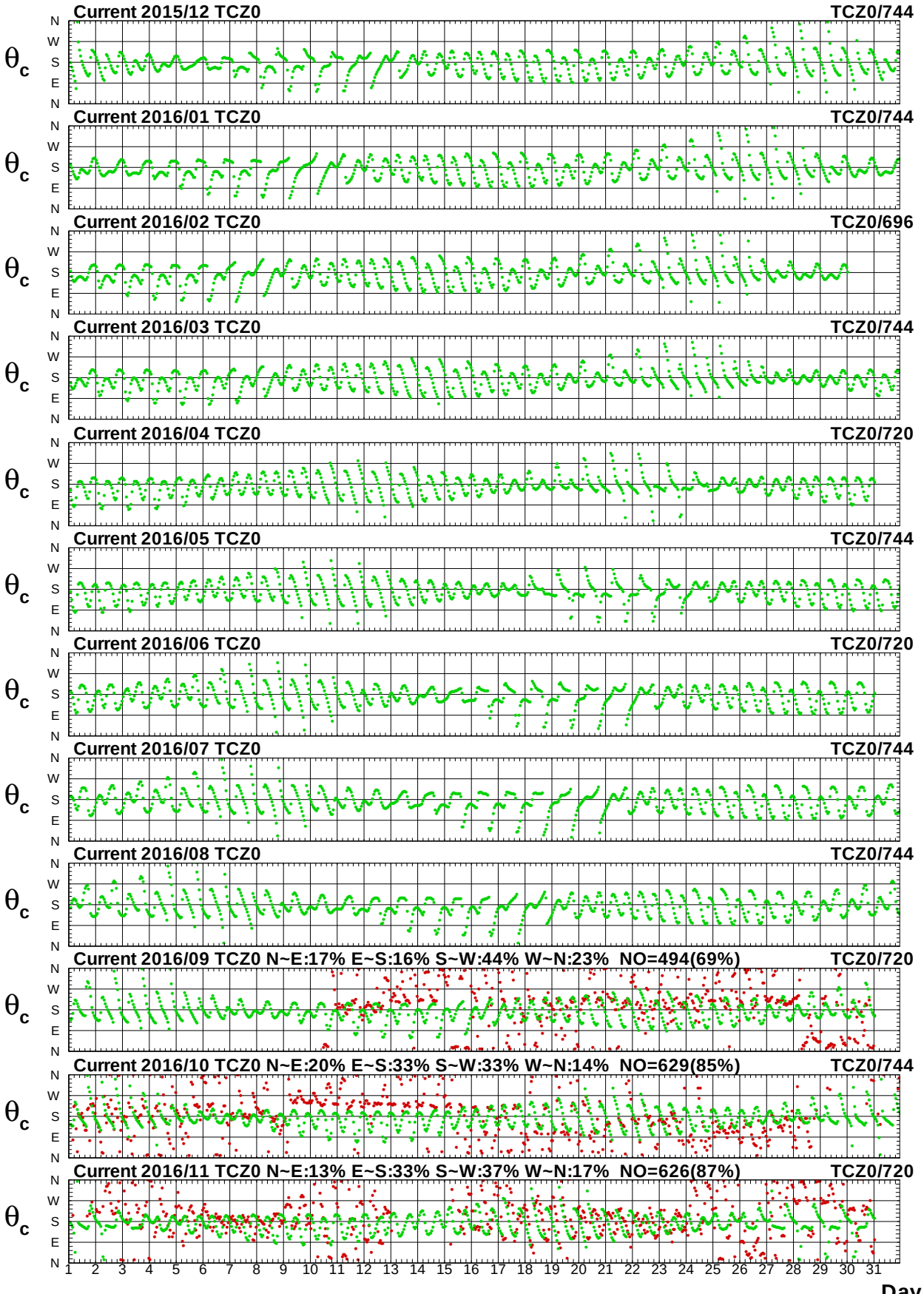

圖 4.5b　2016年每月中雲海域 Z 站觀測與潮流流向比較圖

C15CTCZ0.1H0 C15CTCZ0.1HD C161TCZ0.1H0 C161TCZ0.1HD C162TCZ0.1H0 C162TCZ0.1HD
C163TCZ0.1H0 C163TCZ0.1HD C164TCZ0.1H0 C164TCZ0.1HD C165TCZ0.1H0 C165TCZ0.1HD

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Current Speed in Chung-Yun Seas of TCZ0 at 2016

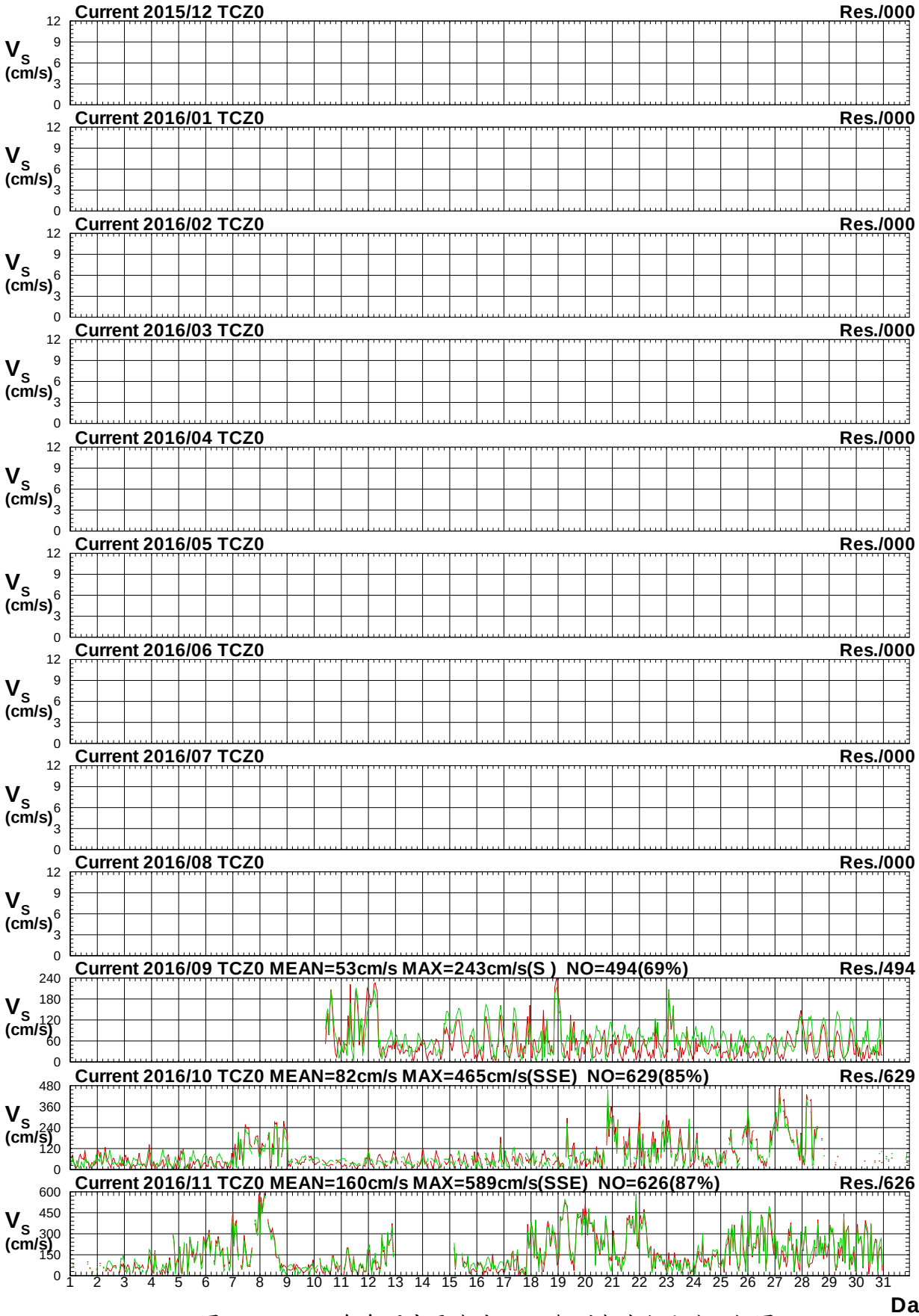

圖 4.6a　2016年每月中雲海域 Z 站觀測與非潮流速比較圖

C15CTCZ0.1H0 C15CTCZ0.1HR C161TCZ0.1H0 C161TCZ0.1HR C162TCZ0.1H0 C162TCZ0.1HR
C163TCZ0.1H0 C163TCZ0.1HR C164TCZ0.1H0 C164TCZ0.1HR C165TCZ0.1H0 C165TCZ0.1HR

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Current Direction in Chung-Yun Seas of TCZ0 at 2016

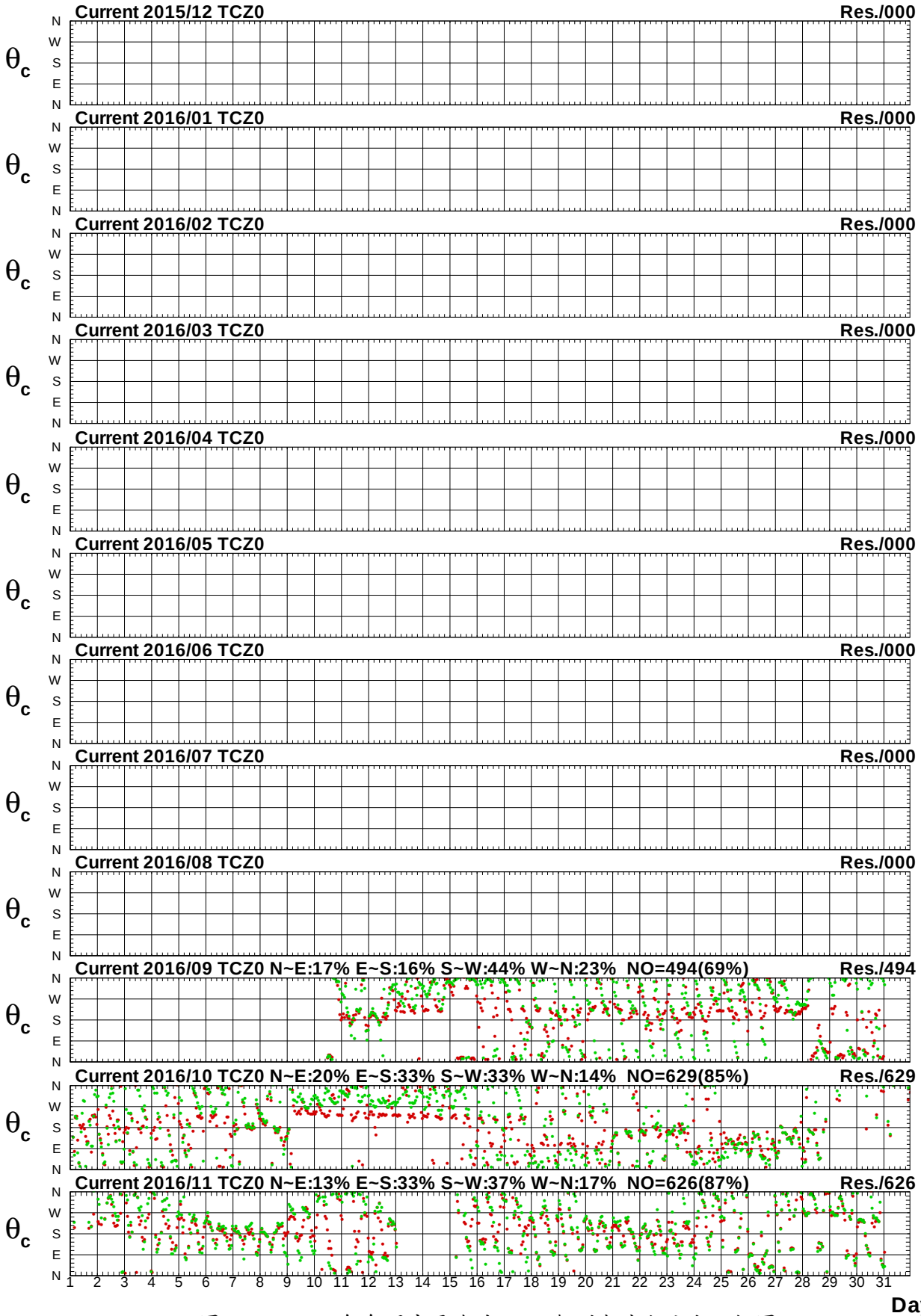

圖 4.6b　2016年每月中雲海域 Z 站觀測與非潮流向比較圖

C15CTCZ0.1H0 C15CTCZ0.1HR C161TCZ0.1H0 C161TCZ0.1HR C162TCZ0.1H0 C162TCZ0.1HR
C163TCZ0.1H0 C163TCZ0.1HR C164TCZ0.1H0 C164TCZ0.1HR C165TCZ0.1H0 C165TCZ0.1HR

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Current Speed in Chung-Yun Seas of TCR0 at 2016

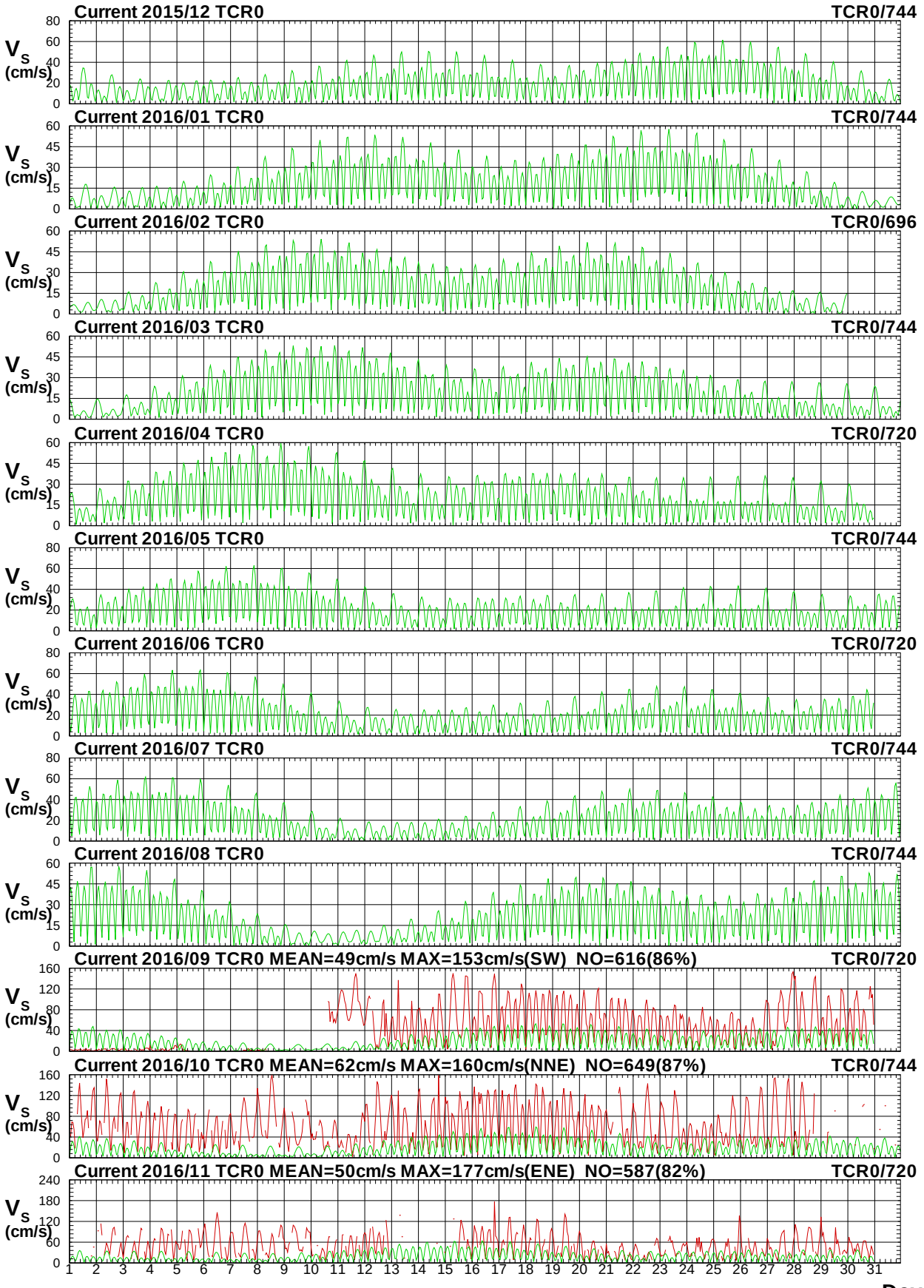

圖 4.7a　2016年每月中雲海域 R 站觀測與潮流流速比較圖

C15CTCR0.1H0 C15CTCR0.1HD C161TCR0.1H0 C161TCR0.1HD C162TCR0.1H0 C162TCR0.1HD
C163TCR0.1H0 C163TCR0.1HD C164TCR0.1H0 C164TCR0.1HD C165TCR0.1H0 C165TCR0.1HD

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Current Direction in Chung-Yun Seas of TCR0 at 2016

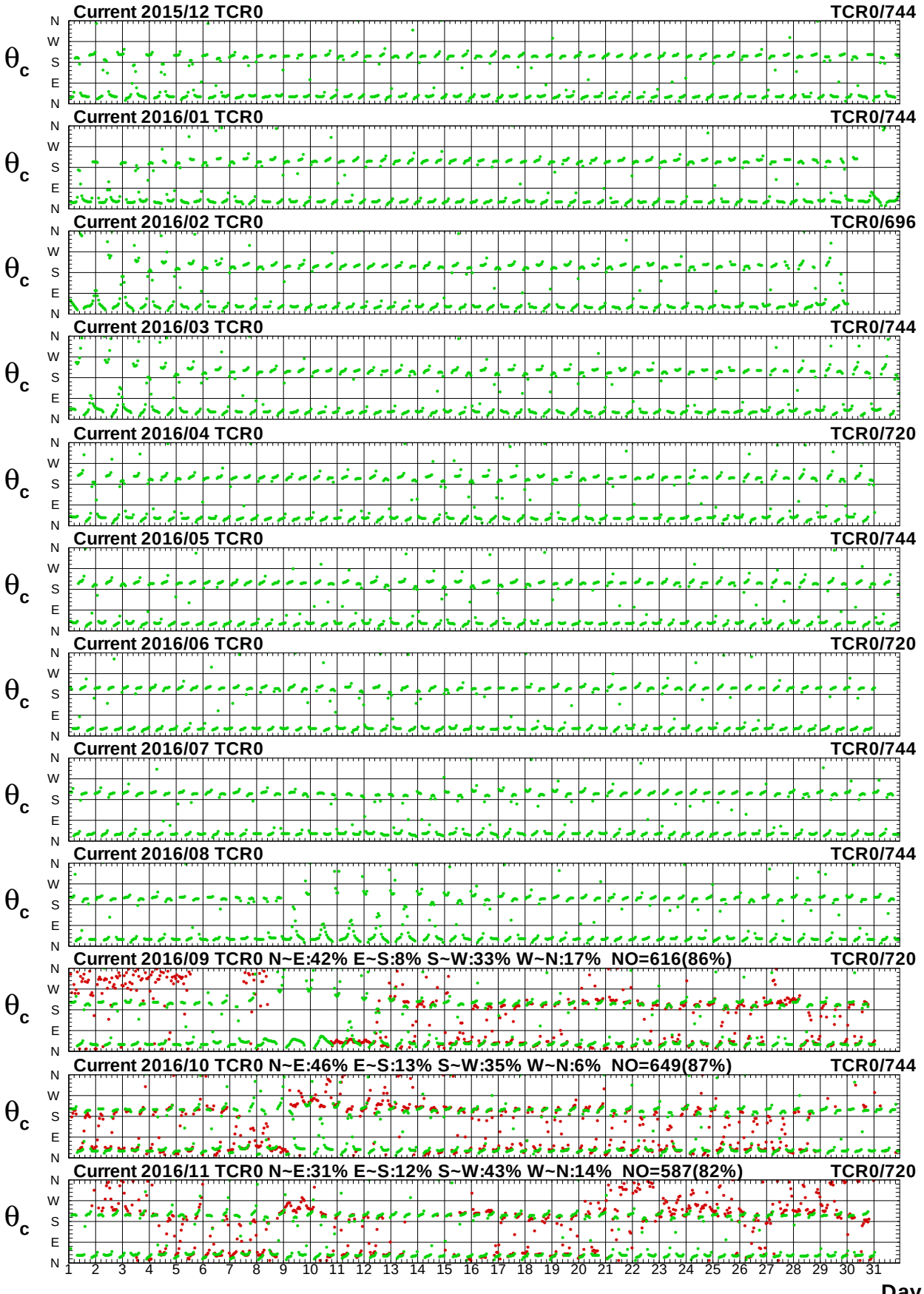

圖 4.7b　2016年每月中雲海域 R 站觀測與潮流流向比較圖

C15CTCR0.1H0 C15CTCR0.1HD C161TCR0.1H0 C161TCR0.1HD C162TCR0.1H0 C162TCR0.1HD
C163TCR0.1H0 C163TCR0.1HD C164TCR0.1H0 C164TCR0.1HD C165TCR0.1H0 C165TCR0.1HD

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Current Speed in Chung-Yun Seas of TCR0 at 2016

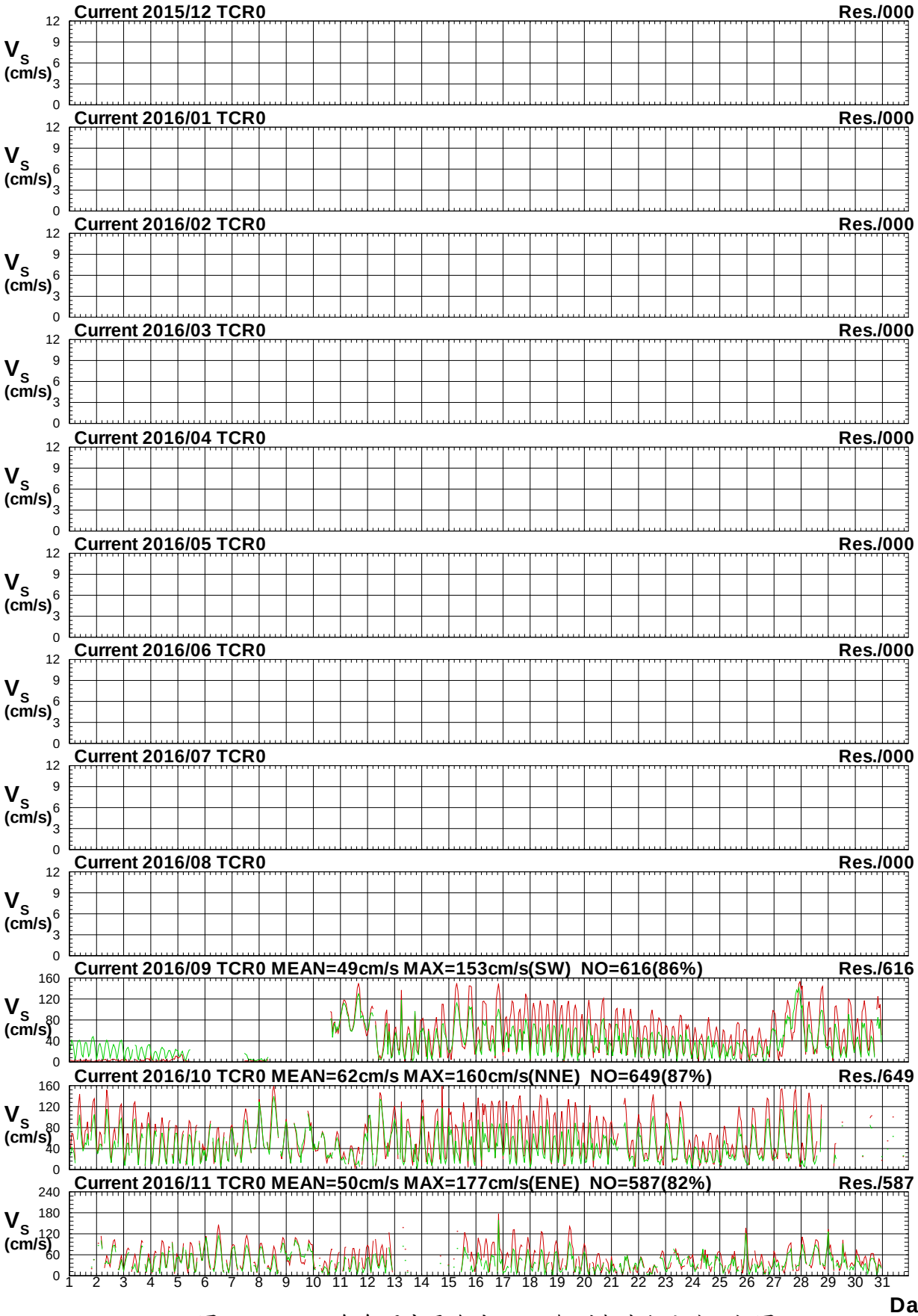

圖 4.8a　2016年每月中雲海域 R 站觀測與非潮流速比較圖

C15CTCR0.1H0 C15CTCR0.1HR C161TCR0.1H0 C161TCR0.1HR C162TCR0.1H0 C162TCR0.1HR
C163TCR0.1H0 C163TCR0.1HR C164TCR0.1H0 C164TCR0.1HR C165TCR0.1H0 C165TCR0.1HR

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Current Direction in Chung-Yun Seas of TCR0 at 2016

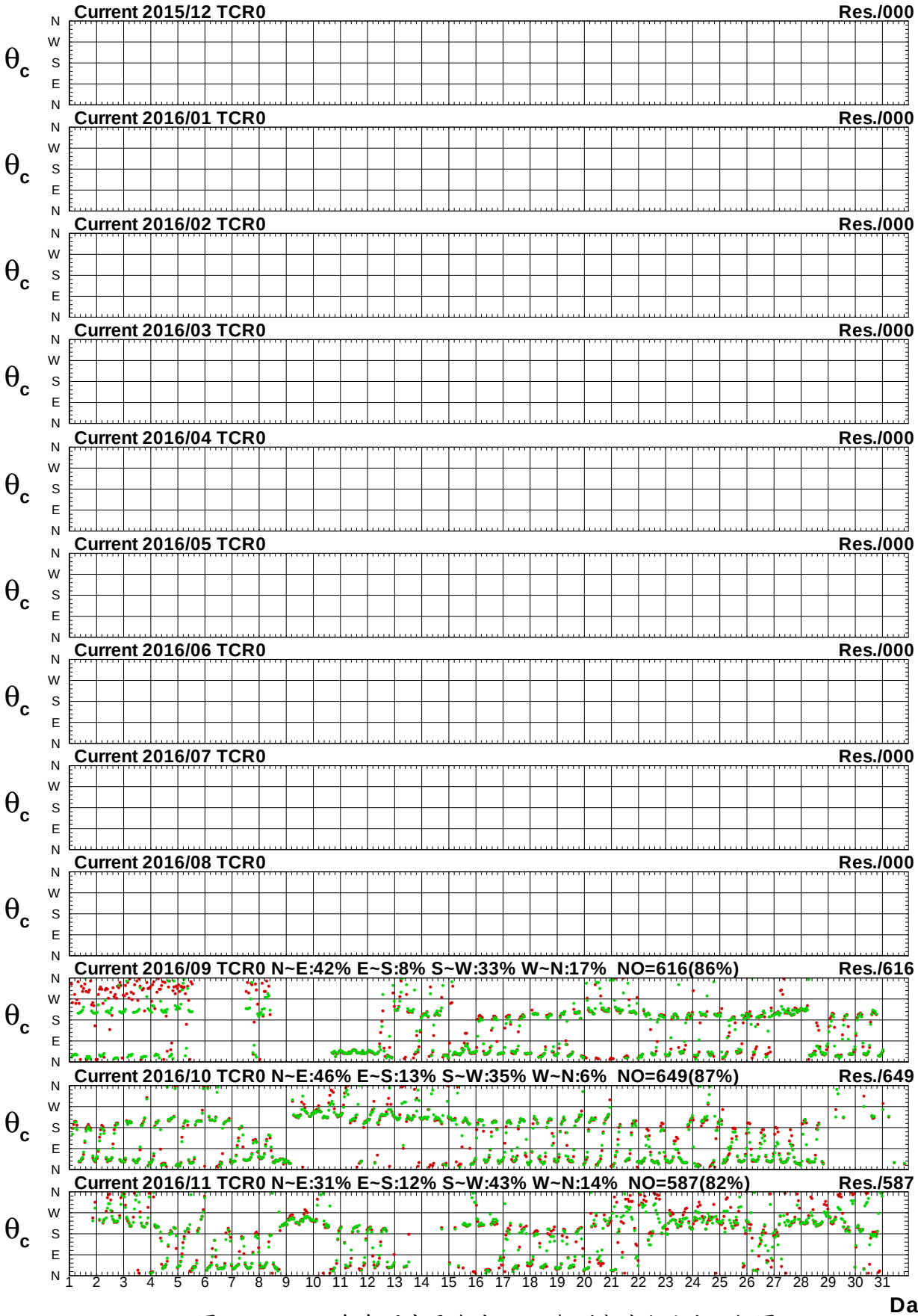

圖 4.8b　2016年每月中雲海域 R 站觀測與非潮流向比較圖

C15CTCR0.1H0 C15CTCR0.1HR C161TCR0.1H0 C161TCR0.1HR C162TCR0.1H0 C162TCR0.1HR
C163TCR0.1H0 C163TCR0.1HR C164TCR0.1H0 C164TCR0.1HR C165TCR0.1H0 C165TCR0.1HR

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Current Speed in Chung-Yun Seas of TCX0 at 2016

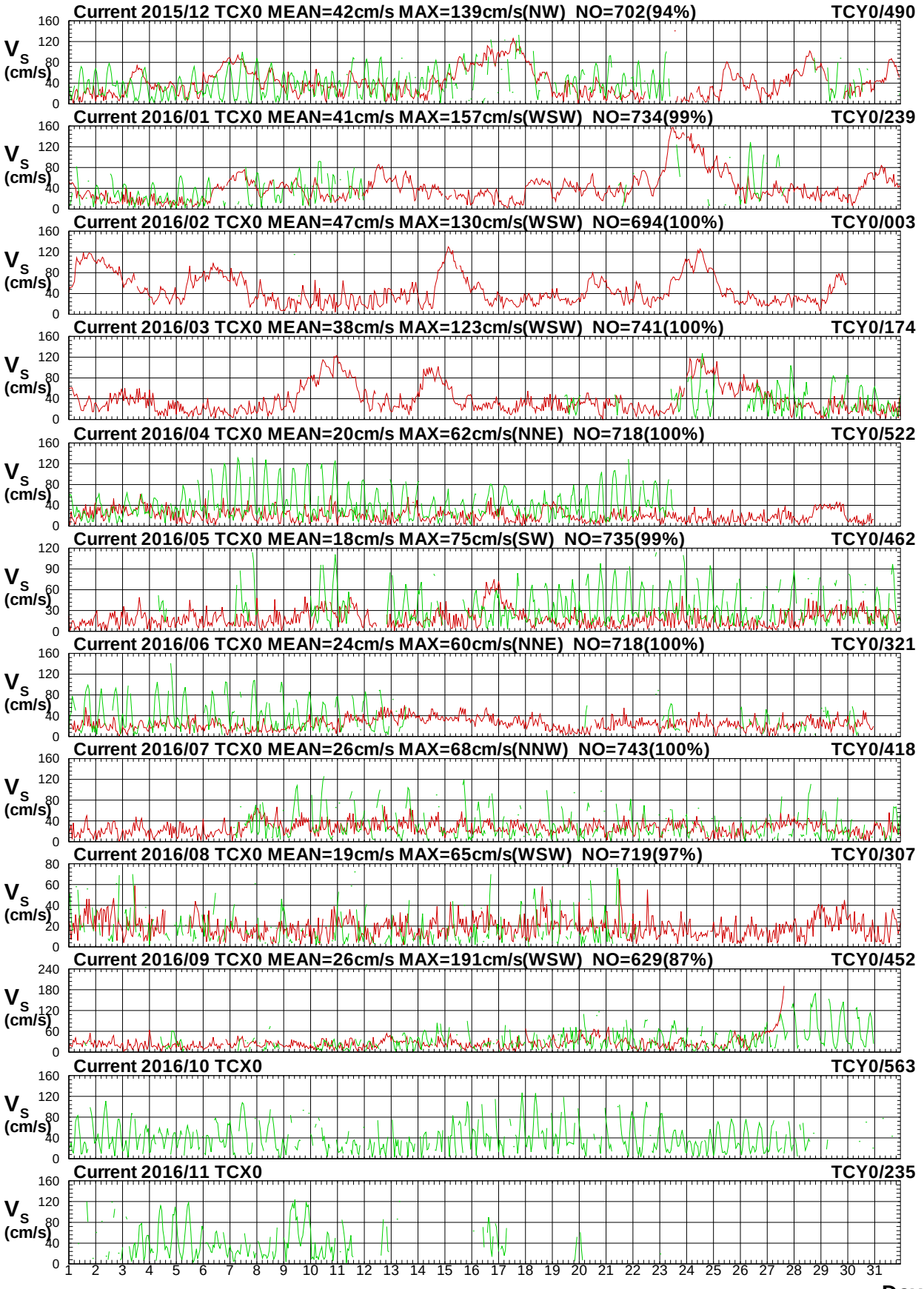

圖 4.9a　2016年每月中雲海域 X 站與 Y 站流速比較圖

C15CTCX0.1H0 C15CTCY0.1H0 C161TCX0.1H0 C161TCY0.1H0 C162TCX0.1H0 C162TCY0.1H0
C163TCX0.1H0 C163TCY0.1H0 C164TCX0.1H0 C164TCY0.1H0 C165TCX0.1H0 C165TCY0.1H0

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Current Direction in Chung-Yun Seas of TCX0 at 2016

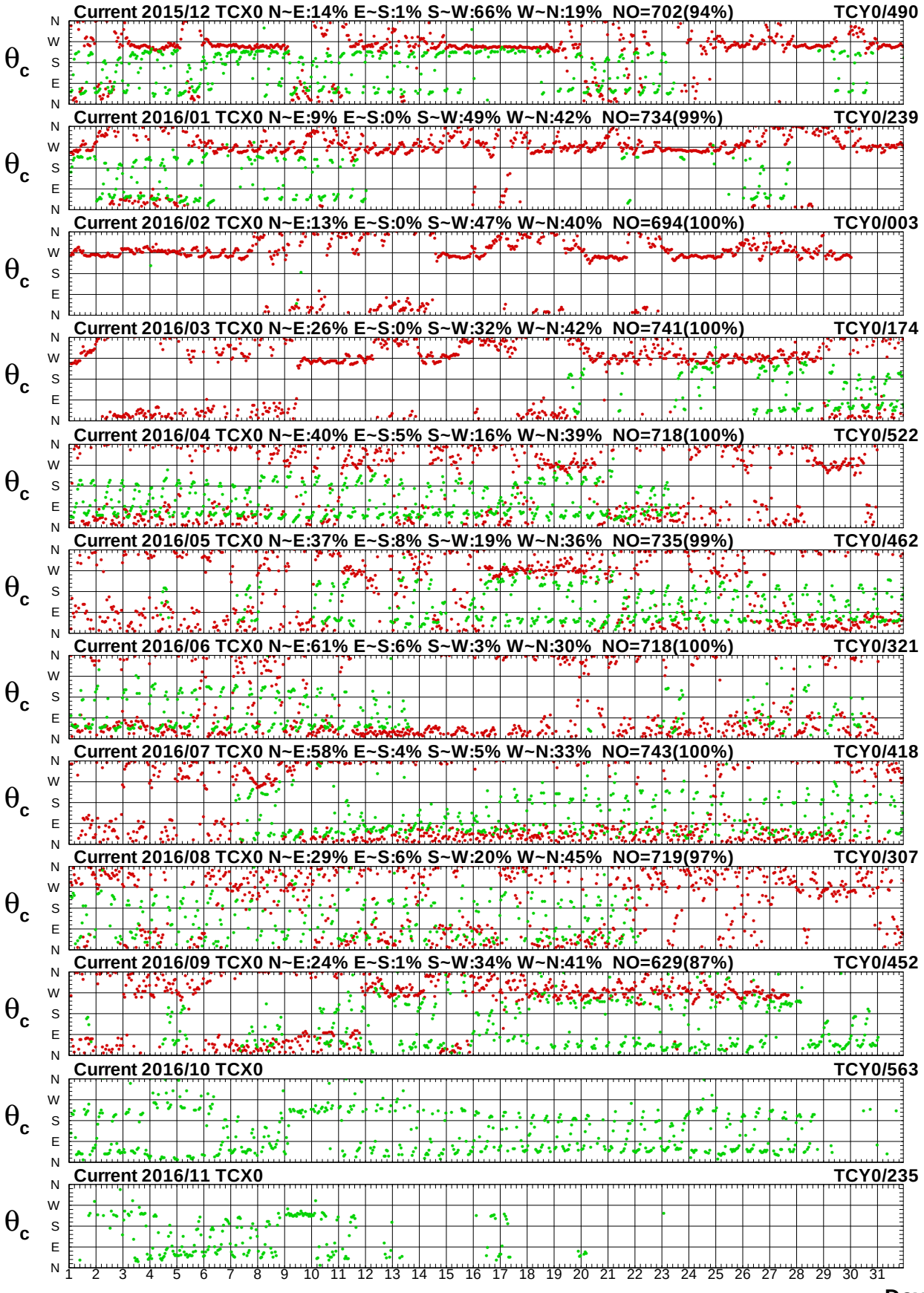

圖 4.9b　2016年每月中雲海域 X 站與 Y 站流向比較圖

C15CTCX0.1H0 C15CTCY0.1H0 C161TCX0.1H0 C161TCY0.1H0 C162TCX0.1H0 C162TCY0.1H0
C163TCX0.1H0 C163TCY0.1H0 C164TCX0.1H0 C164TCY0.1H0 C165TCX0.1H0 C165TCY0.1H0

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Current Speed in Chung-Yun Seas of TCX0 at 2016

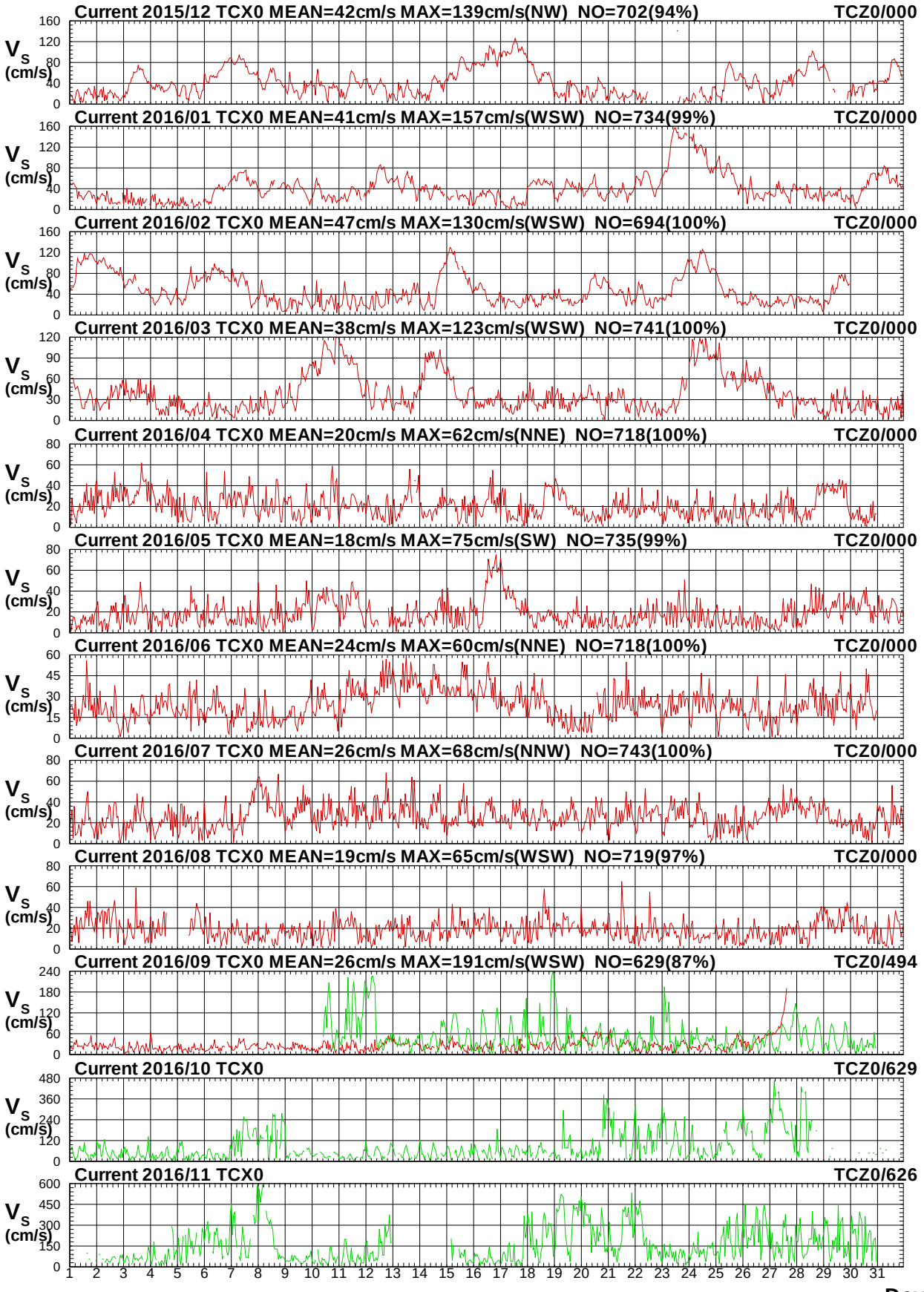

圖4.10a　2016年每月中雲海域 X 站與 Z 站流速比較圖

C15CTCX0.1H0 C15CTCZ0.1H0 C161TCX0.1H0 C161TCZ0.1H0 C162TCX0.1H0 C162TCZ0.1H0
C163TCX0.1H0 C163TCZ0.1H0 C164TCX0.1H0 C164TCZ0.1H0 C165TCX0.1H0 C165TCZ0.1H0

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Current Direction in Chung-Yun Seas of TCX0 at 2016

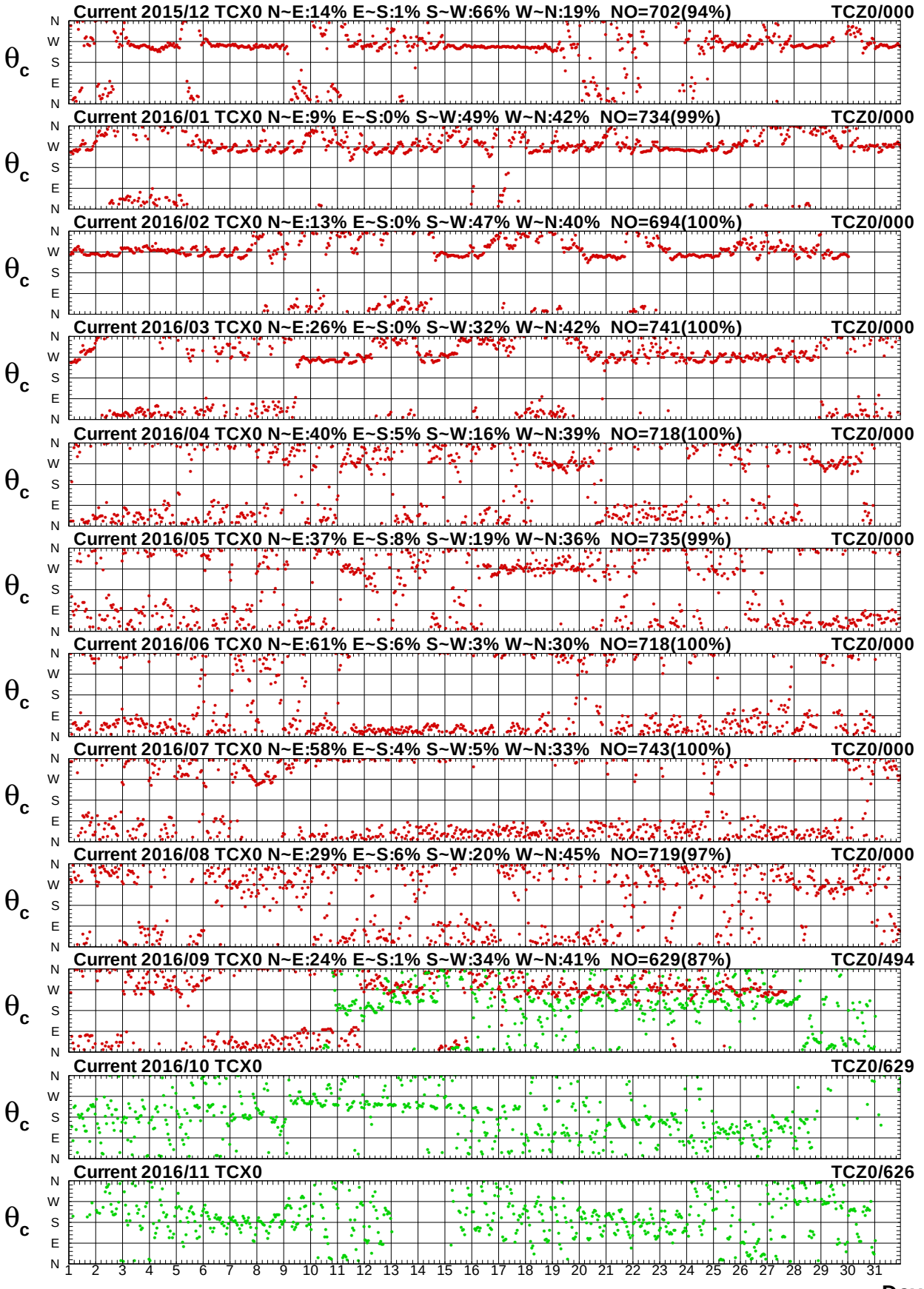

圖4.10b　2016年每月中雲海域 X 站與 Z 站流向比較圖

C15CTCX0.1H0 C15CTCZ0.1H0 C161TCX0.1H0 C161TCZ0.1H0 C162TCX0.1H0 C162TCZ0.1H0
C163TCX0.1H0 C163TCZ0.1H0 C164TCX0.1H0 C164TCZ0.1H0 C165TCX0.1H0 C165TCZ0.1H0

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Current Speed in Chung-Yun Seas of TCX0 at 2016

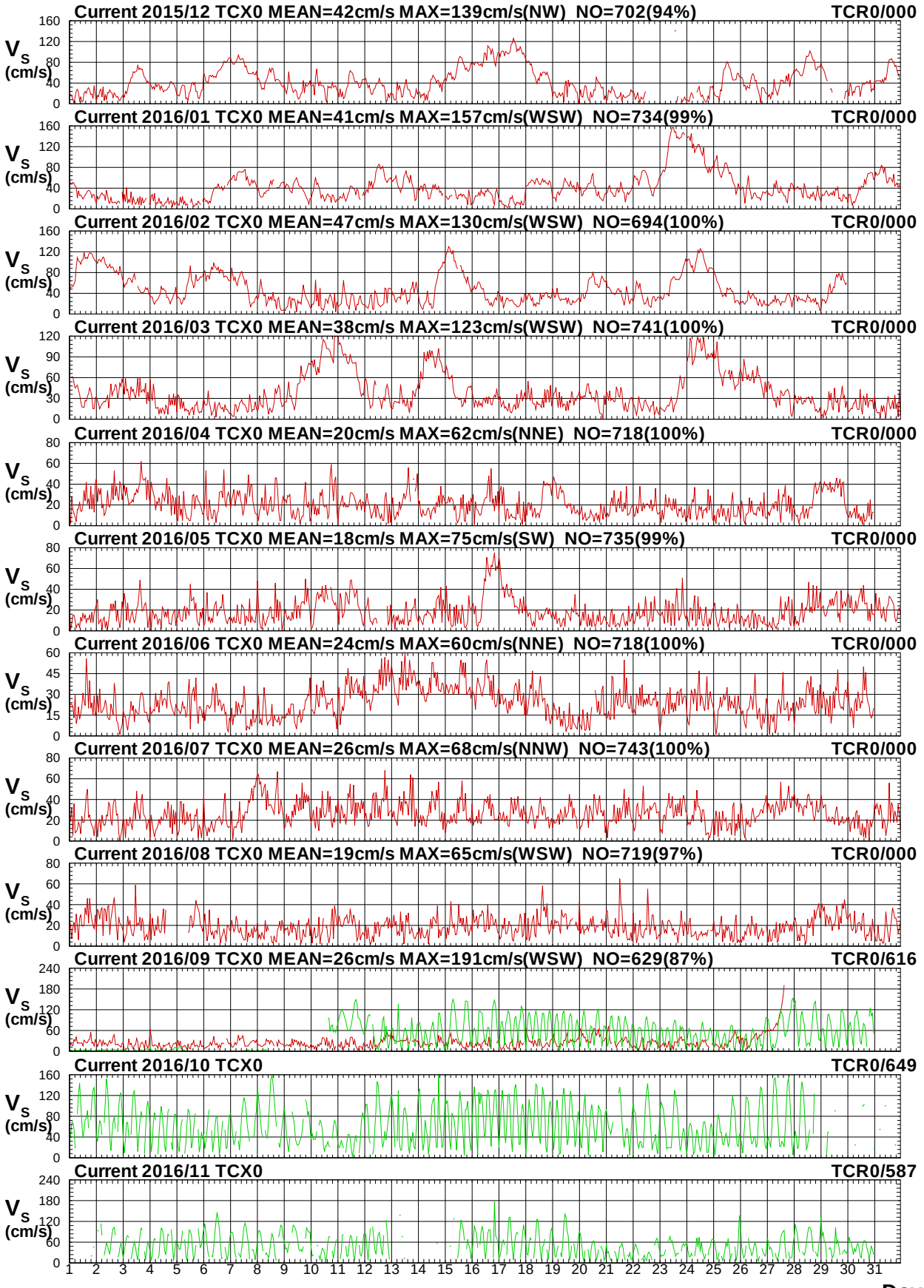

圖 4.11a　2016年每月中雲海域 X 站與 R 站流速比較圖

C15CTCX0.1H0 C15CTCR0.1H0 C161TCX0.1H0 C161TCR0.1H0 C162TCX0.1H0 C162TCR0.1H0
C163TCX0.1H0 C163TCR0.1H0 C164TCX0.1H0 C164TCR0.1H0 C165TCX0.1H0 C165TCR0.1H0

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Current Direction in Chung-Yun Seas of TCX0 at 2016

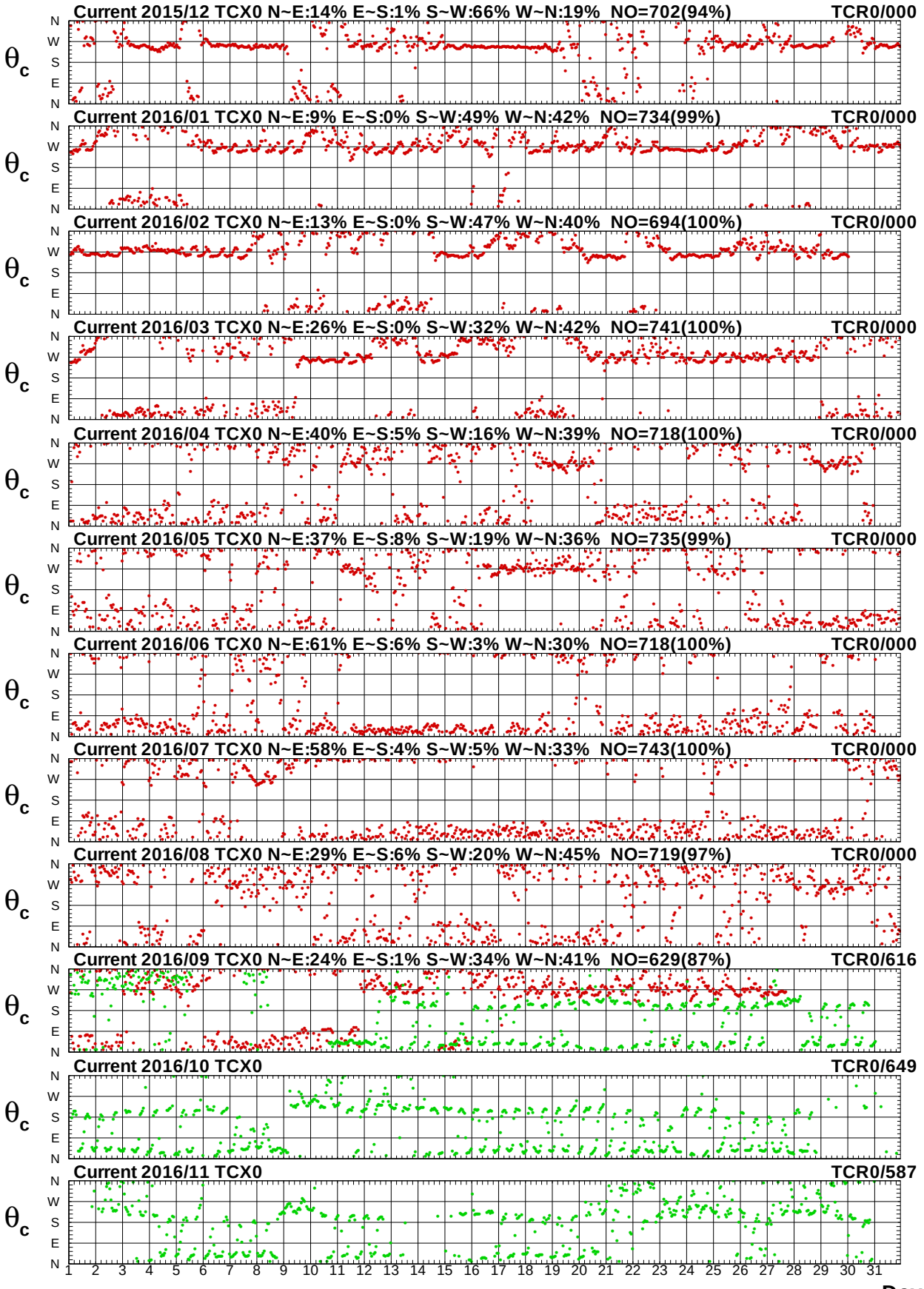

圖4.11b　2016年每月中雲海域 X 站與 R 站流向比較圖

C15CTCX0.1H0 C15CTCR0.1H0 C161TCX0.1H0 C161TCR0.1H0 C162TCX0.1H0 C162TCR0.1H0
C163TCX0.1H0 C163TCR0.1H0 C164TCX0.1H0 C164TCR0.1H0 C165TCX0.1H0 C165TCR0.1H0

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