

大氣海洋聯合觀測

航次LGD2602

2026.03.10 – 04.02

東北風環境海洋層積雲 邊界層日夜變化

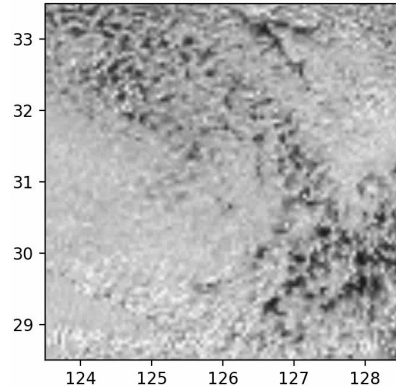
PI：(NTU) 陳維婷、曾開治、(NCU) 張偉裕

登船工作人員：(NTU) 黃懷逸、許米棋、
伍人禾、烏弘智、陳欣鈺、何孫興、(NCU)
陳宇甄、鄭米秀、李政均、張祐愷

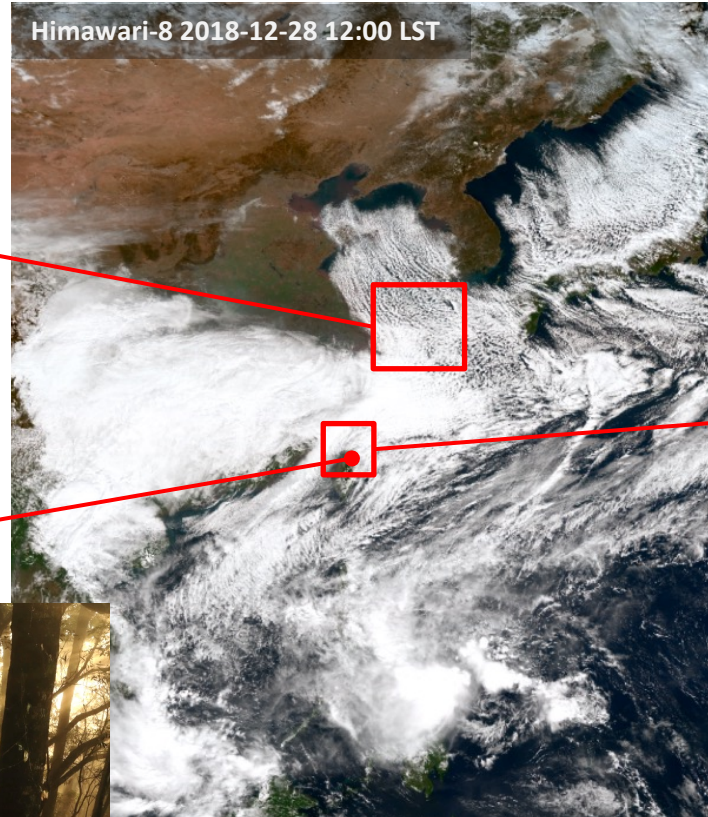
船載儀器設置人員：楊菁華 (PCCU)



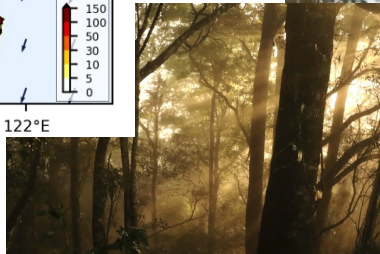
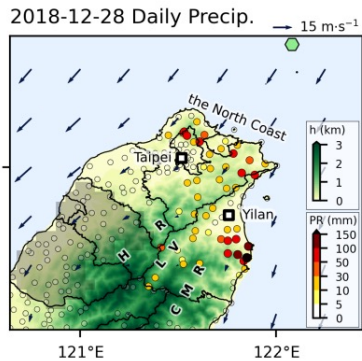
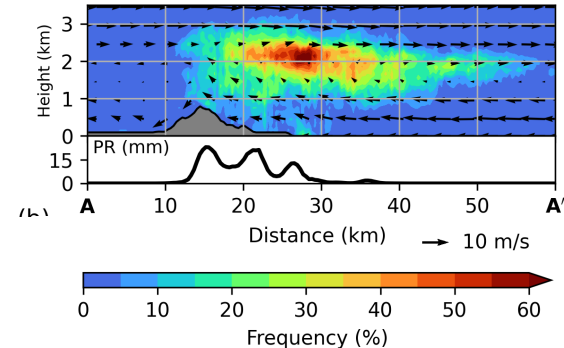
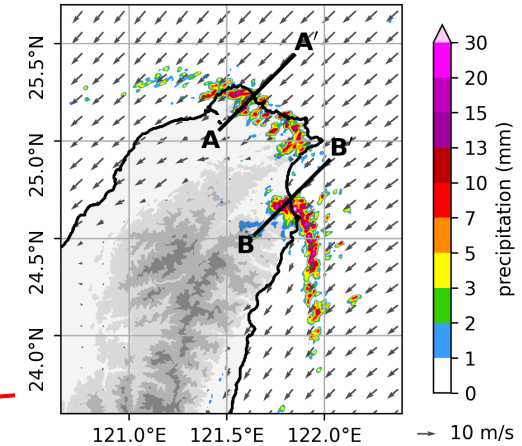
Wintertime Orographic precipitation and cloud fog under a Stratocumulus-Topped Boundary Layer in Northern Taiwan



Himawari-8 2018-12-28 12:00 LST

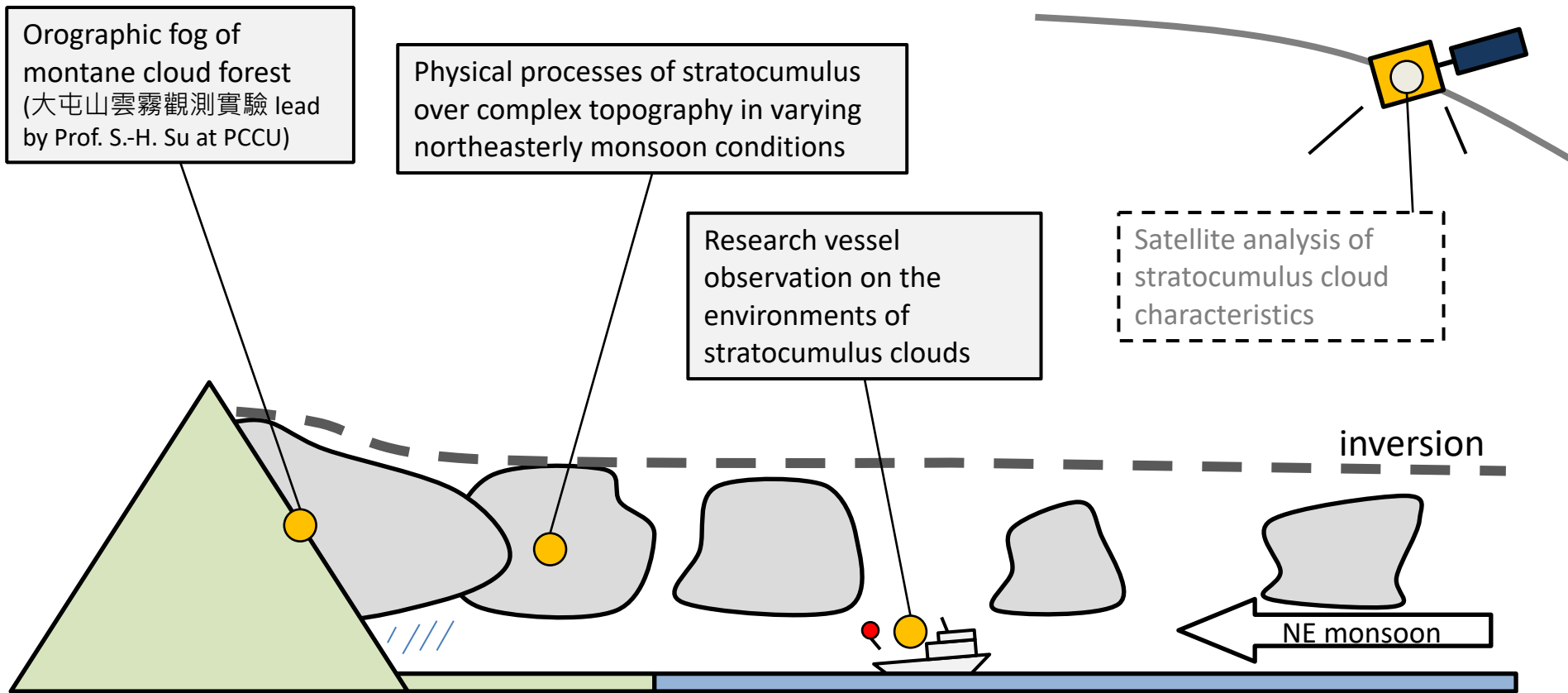


500-m TaiwanVVM
Large Eddy Simulation



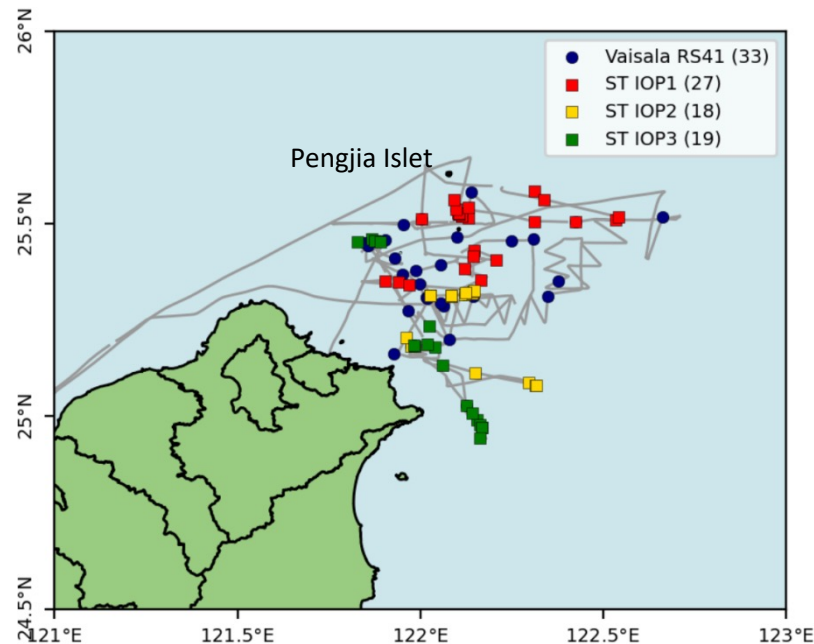
[Huang et al.,
2026]

Wintertime Orographic Precipitation and Fog under a Stratocumulus-Topped Boundary Layer in Northern Taiwan

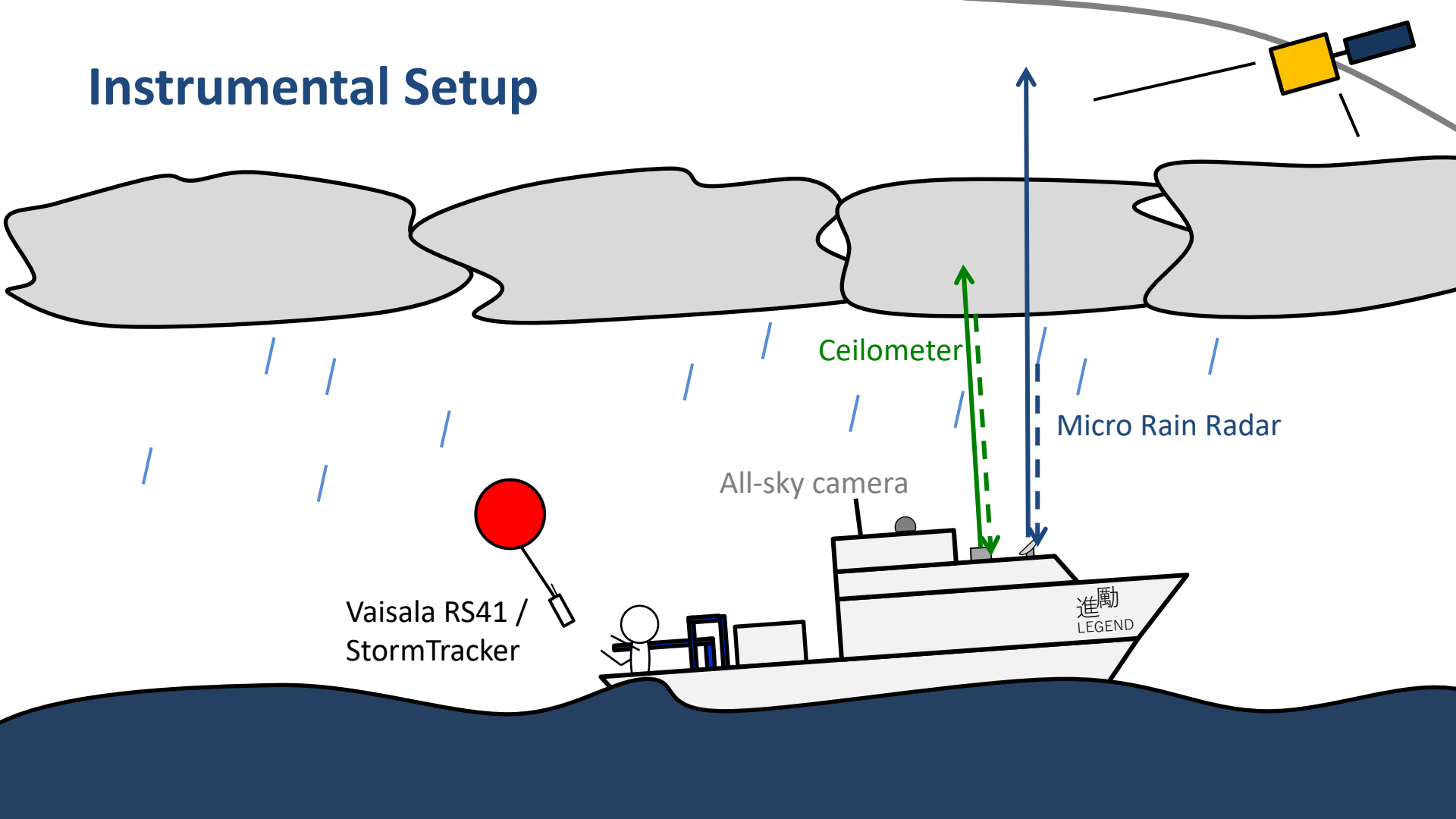


LEGEND cruise (LGD2602) for boundary layer observation in offshore northern Taiwan

- Goal: observing stratocumulus under various thermodynamic environments and surface fluxes
- Date: 2026.03.10 – 2026.03.21, 2026.03.25 – 2026.04.02
- Intense Observation Periods (IOPs):
 - IOP1: 03.12 20:00 – 03.15 22:00LST
 - IOP2: 03.19 06:00 – 03.20 22:00LST
 - IOP3: 03.26 06:00 – 03.28 20:00LST
- Instrument
 - Vaisala RS41 sonding [everyday at 02, 14 LST]
 - Storm Tracker sonding [IOP only; 2 hourly]
 - Ceilometer
 - Micro rain radar
 - Weather station
 - All-sky camera
 - Photosynthetically Active Radiation



Instrumental Setup

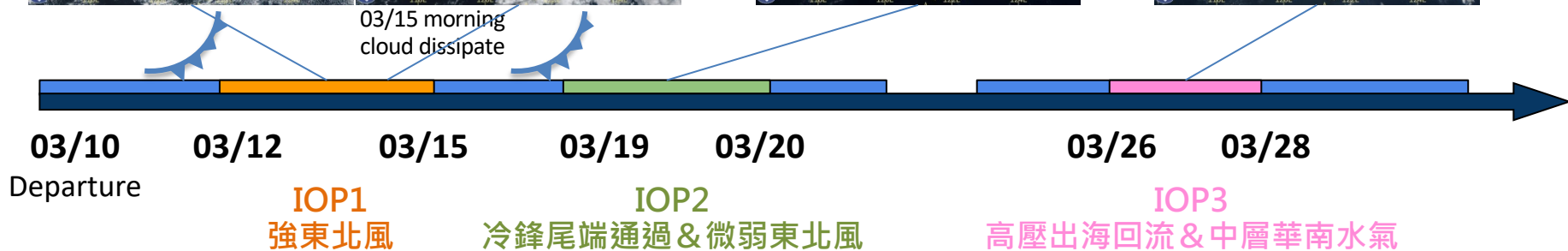
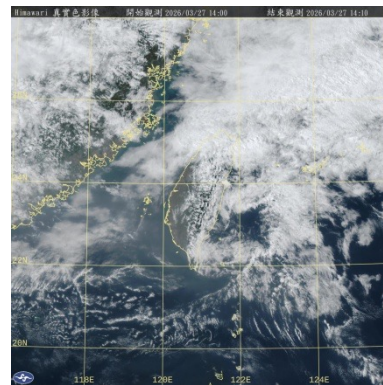
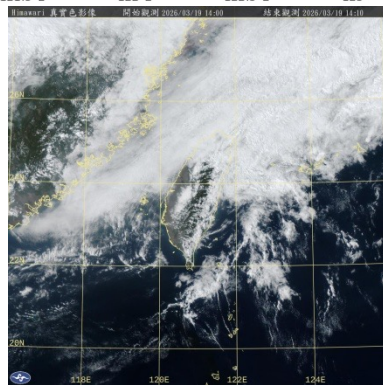
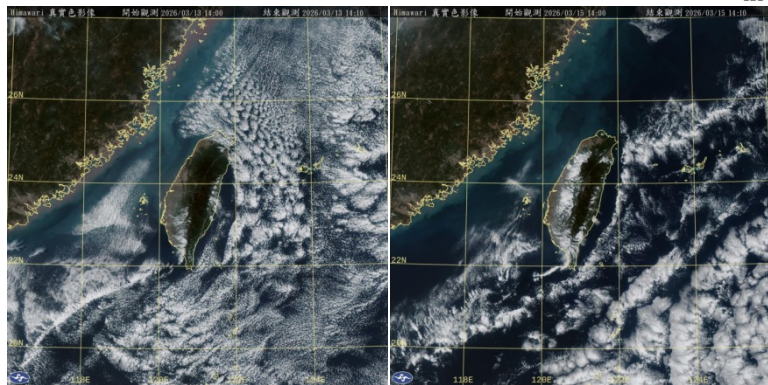
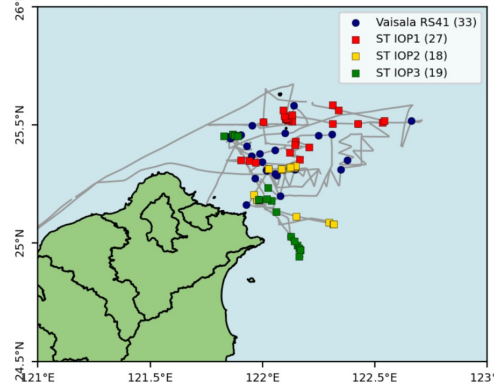




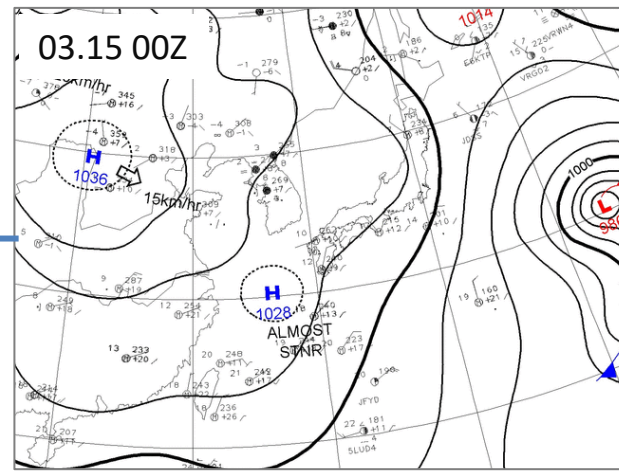
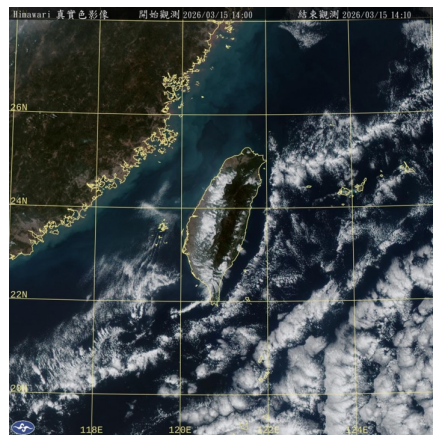
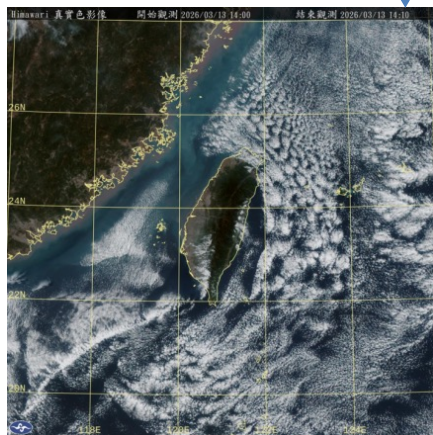
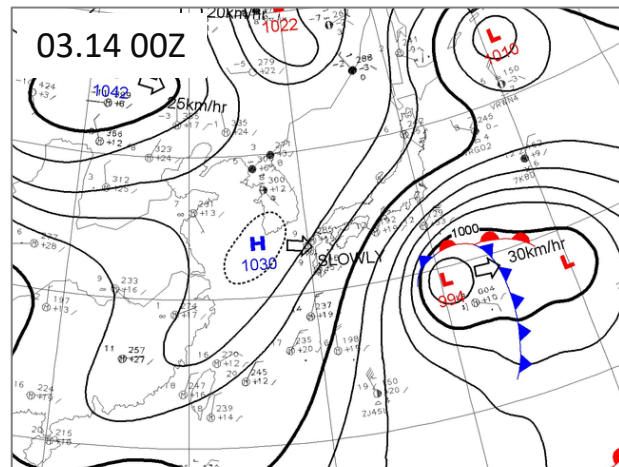
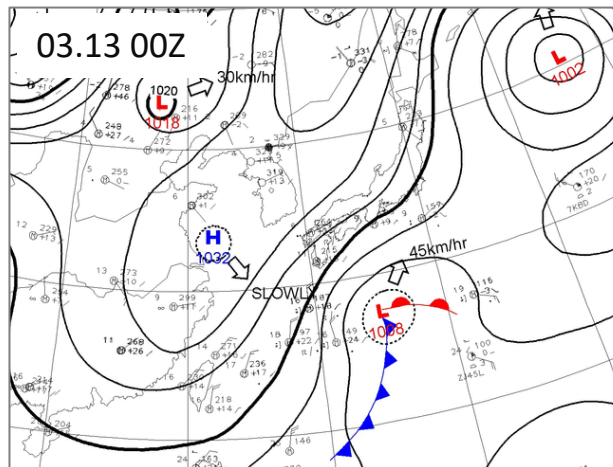
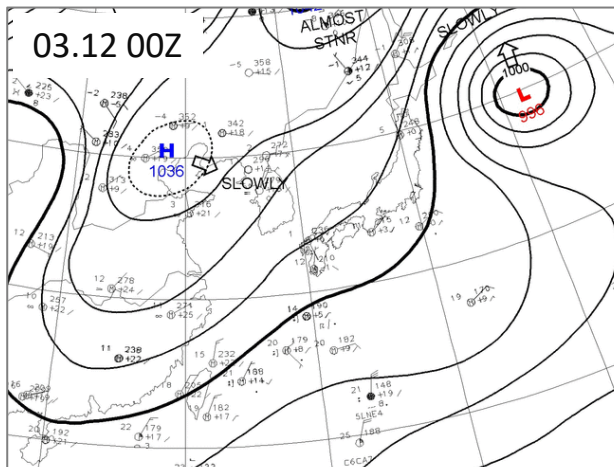


[credit:黃懷逸]

Weather Events During The Three IOPs

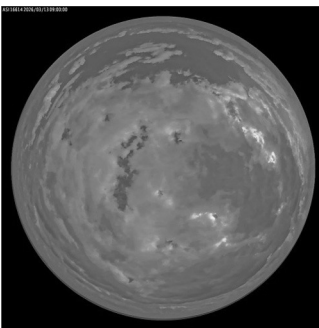


IOP1 強東北風 (03.12 20:00 – 03.15 22:00 LST)

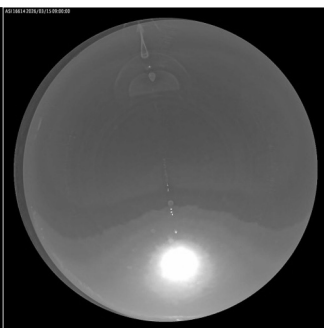


Formation of the well-mixed Sc-topped BL after cold air outbreak; rapid dissipation once decoupled

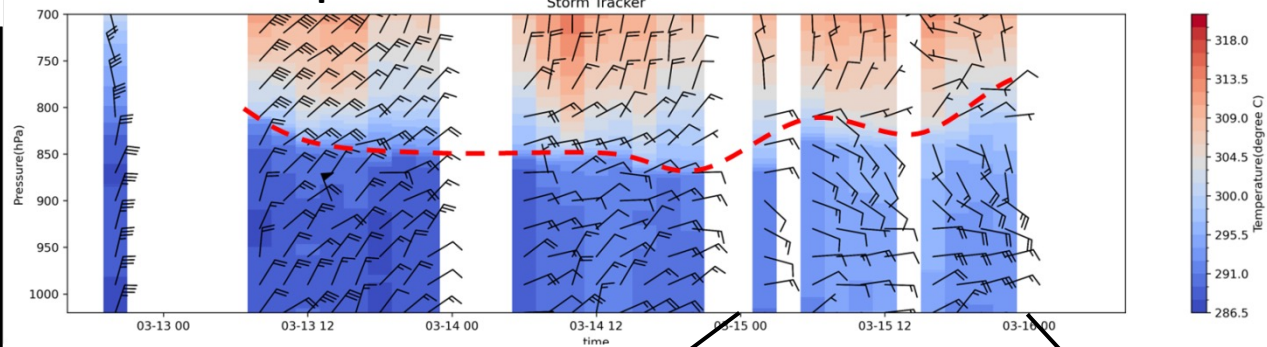
0313 09LST



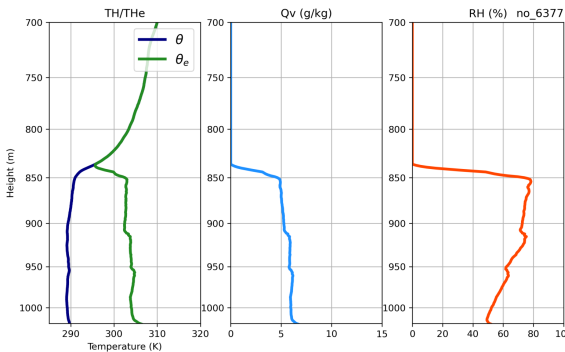
0315 09LST



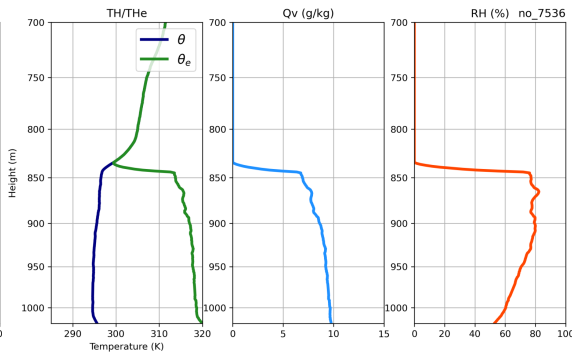
Potential Temperature



0313 12LST

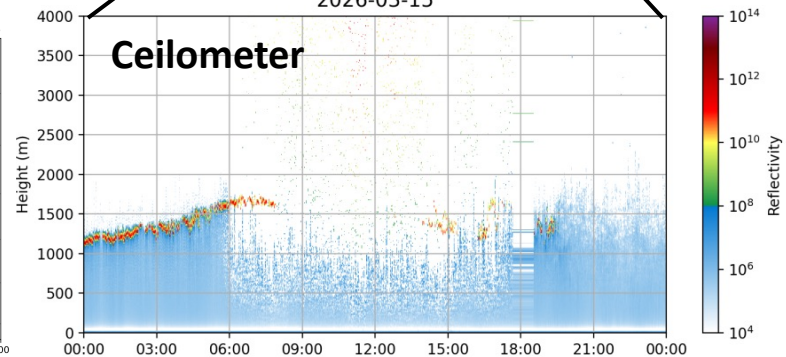


0315 12LST

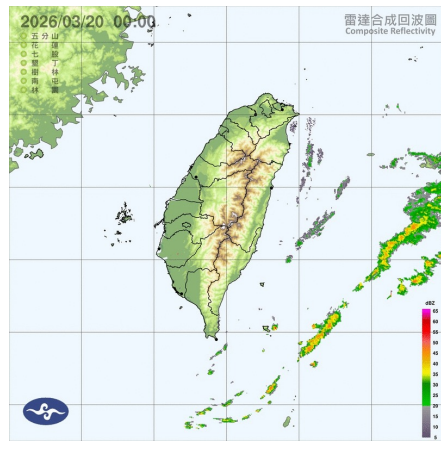
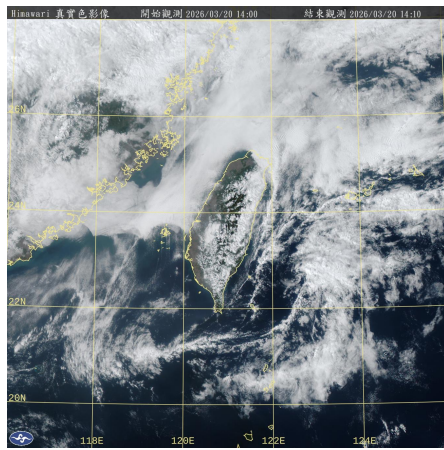
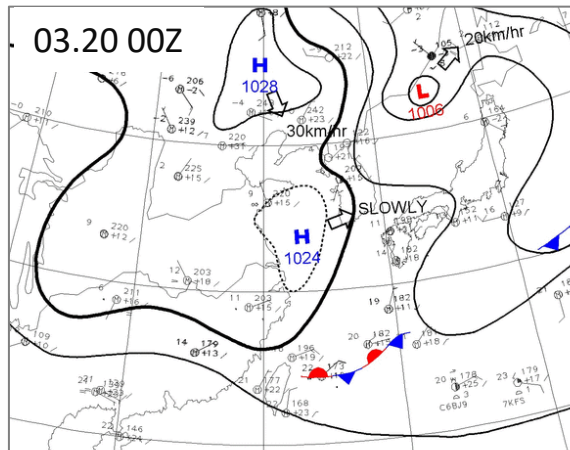
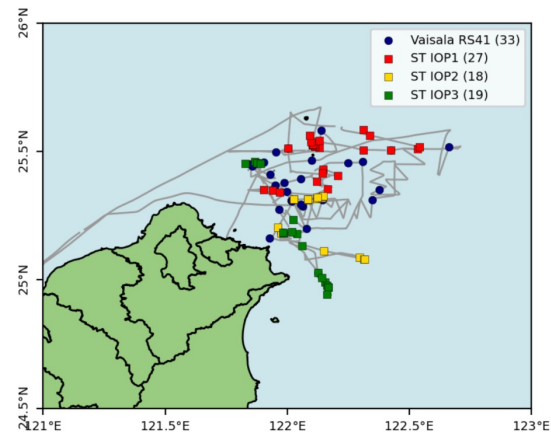
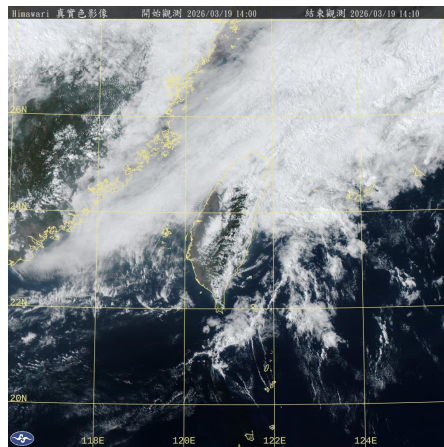
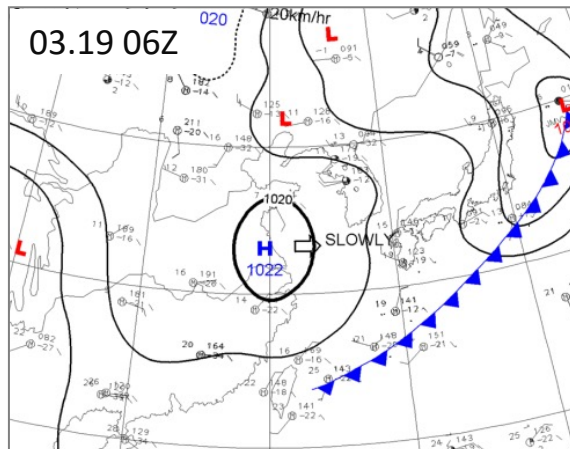


2026-03-15

Ceilometer

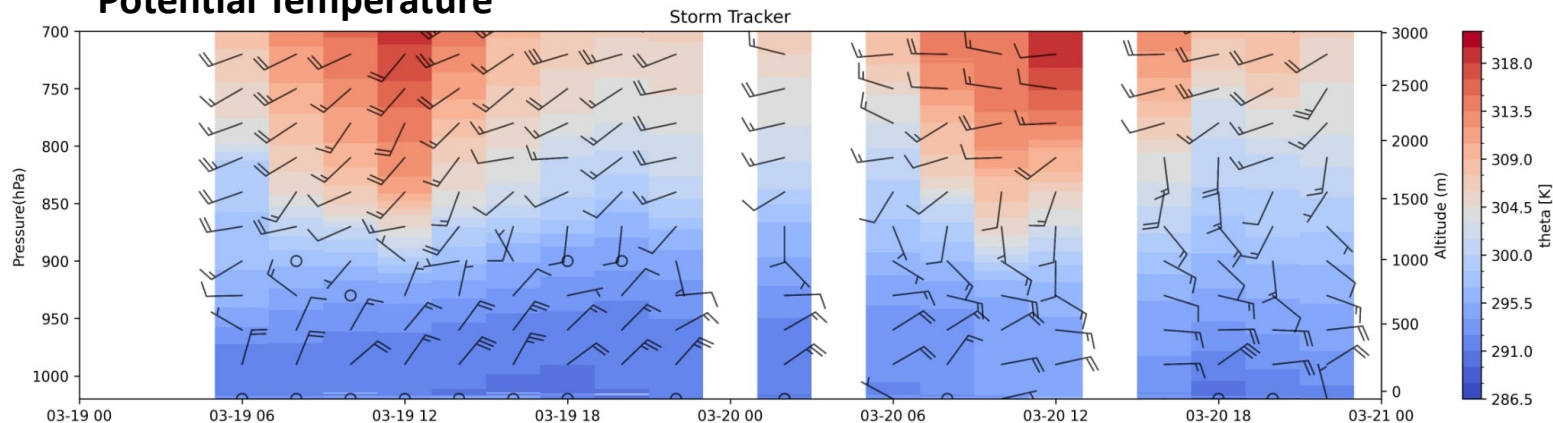


IOP2 冷鋒尾端通過 & 微弱東北風 (03.19 06:00 – 03.21 20:00 LST)

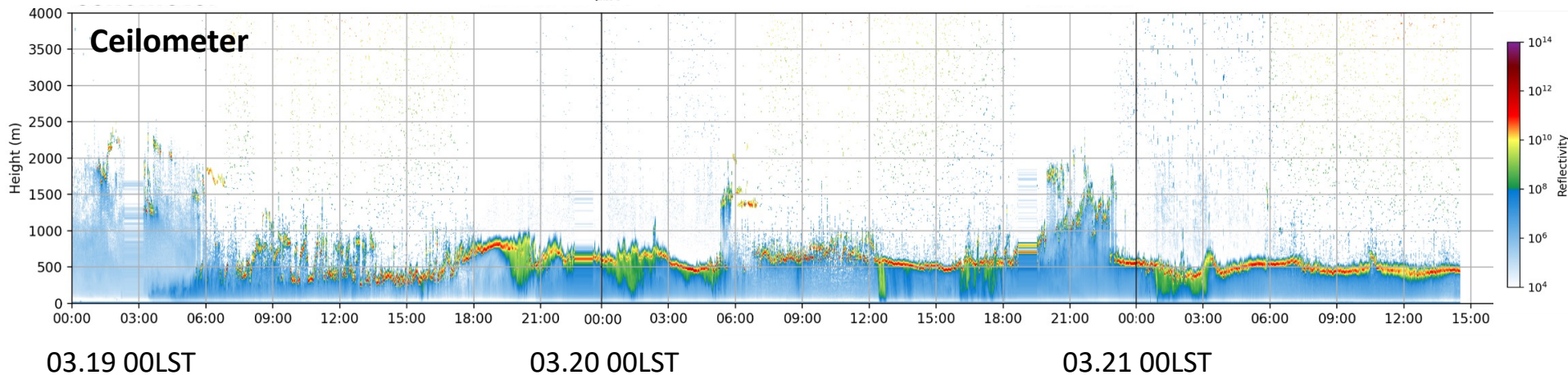


Low cloud top roughly correspond to the top of low-level NElies

Potential Temperature

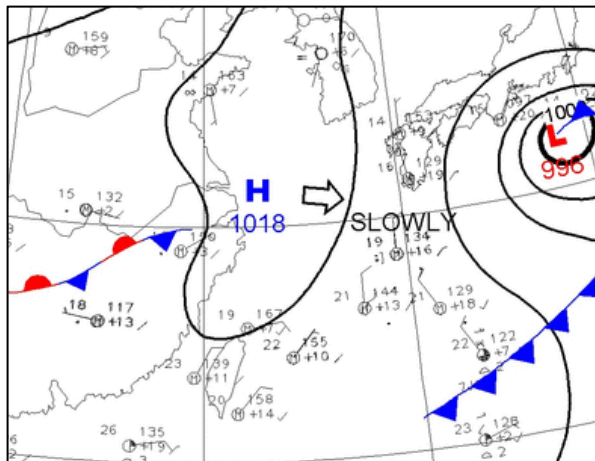


Ceilometer

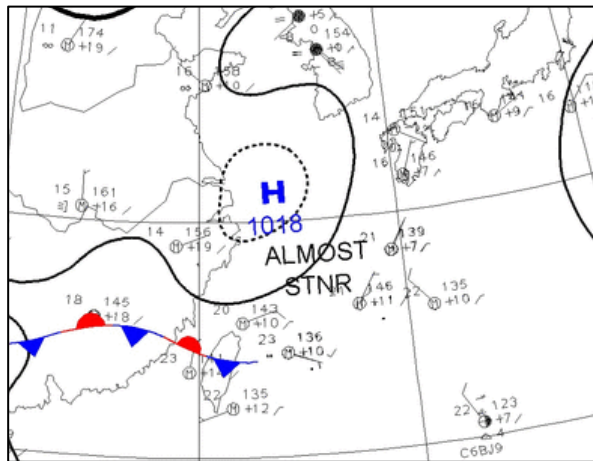


IOP3 高壓出海回流+中層華南水氣 (03.26 08:00 – 03.28 20:00 LST)

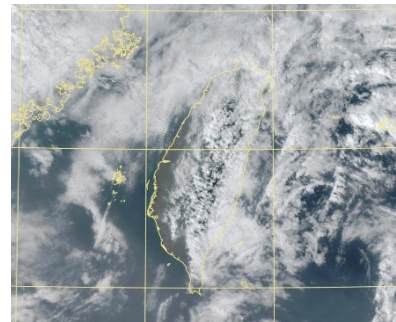
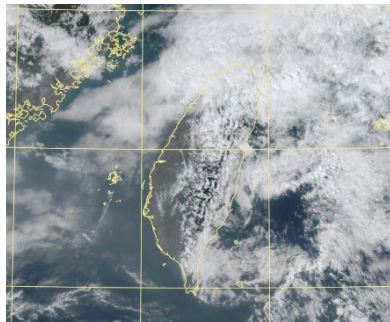
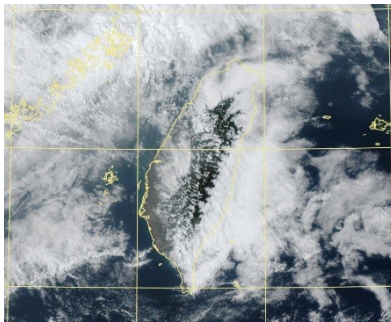
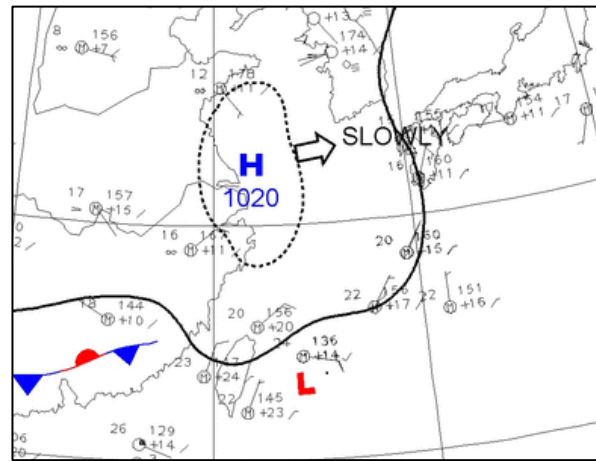
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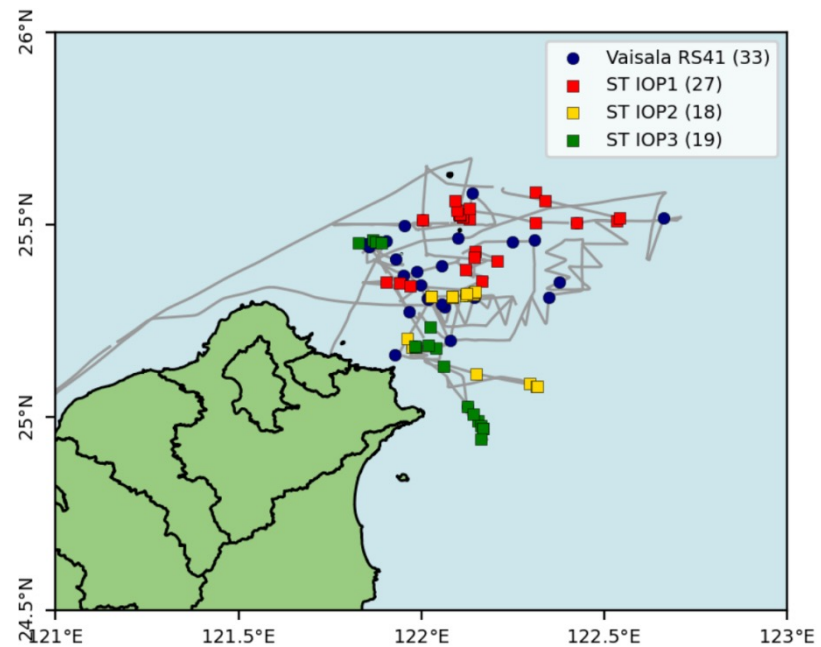
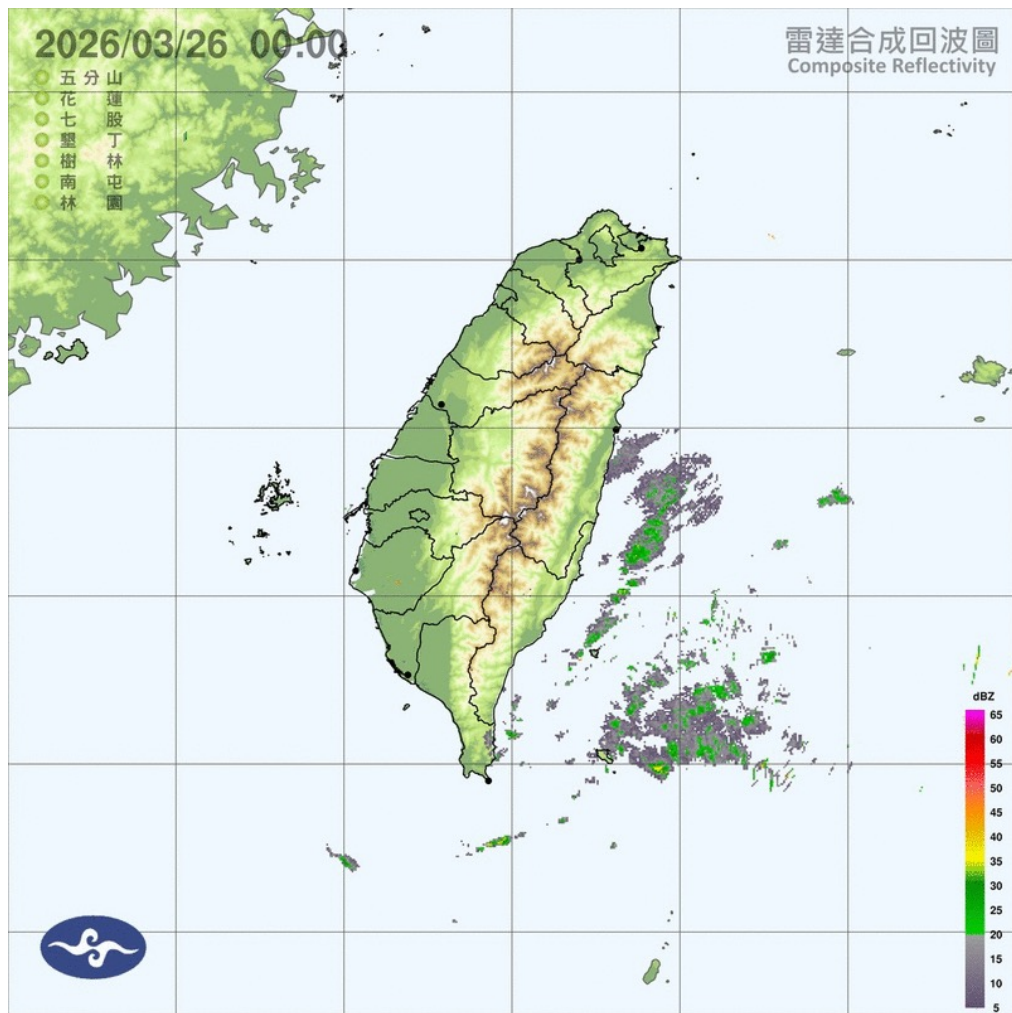


03.27 00Z

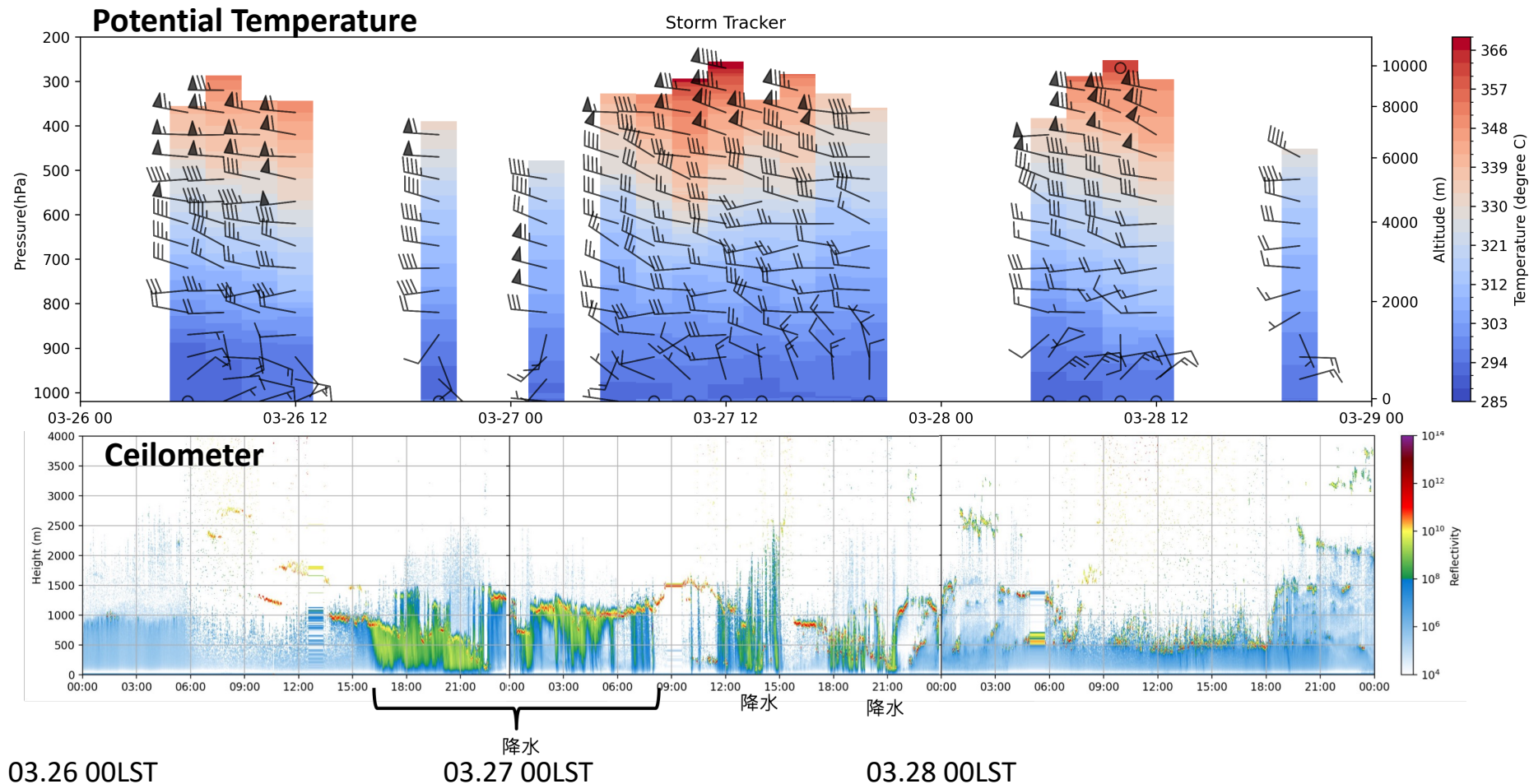


03.28 00Z





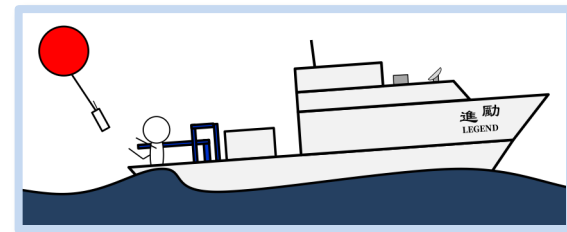
Strong westerlies above ABL; light rain after mid-lev moisture advection



Ongoing work

- TaiwanVVM LES for IOP1 using observed sonding, with different SST/1D ocean model
- Closer examination for IOP2 (Sc) and IOP3 (light rain)
- Analyze ABL structure from 彭佳嶼, RV Legend to 大屯山
- Analyze with collocated satellite products (Himawari-9, COSMIC RO, EarthCARE...etc, supported by WT Chen's 福衛增值計劃)
- All the observation data of this cruise, including the selected satellite products during Mar-Apr 2026 over N Taiwan, will be released through ASRAD (大氣科學研究與應用資料庫)

Thanks A Million for All The Support From TORI, RV LEGEND, and NTUOI



2027/1 在高雄外海的大氣海洋聯合觀測

- 船可以移動觀測背風渦旋3D結構（ lidar+探空 + MAXDOA ）
- 高雄陸地上借用CWA lidar，定點施放探空，工研院的測風lidar（ 8月驗收 ）