

PISTON 2019 Daily Science Summary

16 September Daily Summary: 95W Returns

PISTON 2, R/V Sally Ride

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After several days of a dry mid-troposphere and small, short-lived thunderstorms, the trend was finally bucked as a large mesoscale convective complex, likely associated with 95W, rapidly developed and pushed south over the operations area.

The day started off with conditions similar to previous: dry mid-levels on the soundings (Fig. 1), and widely scattered convection with storm tops generally below 6km. Some higher levels of organization were noted early on, with a few thin, low-topped, WSW – ENE oriented lines of showers passing southward over the radar (Fig. 2). Around 12Z, a much larger area of precipitation began to push into the northern limit of SEAPOL's view. By this time, soundings also showed that the profile had moistened slightly (particularly in the lower levels), with precipitable water values climbing back up above 60 mm (Fig. 1).

Looking at satellite imagery (Fig. 3), it was noted that a large area of convection in the vicinity of 95W had flared up, and was rapidly pushing southward towards the ship. Precipitation reached the Sally Ride around 15Z (Fig. 4), with a large area of stratiform with embedded convection on SEAPOL's scope. Although not particularly well organized, occasionally a stronger line of convection would develop on the edge of the larger area of rain, and push out ahead of the stratiform region (Fig 5). Storm motions on radar loops were interesting, with the stronger areas of surface-based convection moving east, while the larger stratiform regions moved south or west. This is likely a result of the strong vertical wind shear evident in the 0,6, and 12Z soundings, which have westerlies in the low levels and easterlies aloft (the 18Z sounding has northerlies in the low-levels, but may be convectively contaminated as it was launched into the MCS). This shear was also obvious in loops of RHI cross sections, where embedded convective cells would grow and penetrate the melting layer, and then have their tops blown off by the strong easterlies in the upper-levels.

Some portions of the storm were lost to the blanking sector at times (we were on the northern edge of the 10nm radius the OSU crew needed to stay within so our heading was limited), however for the most part we were able to communicate with the bridge and choose a heading that would give SEAPOL the most coverage possible.

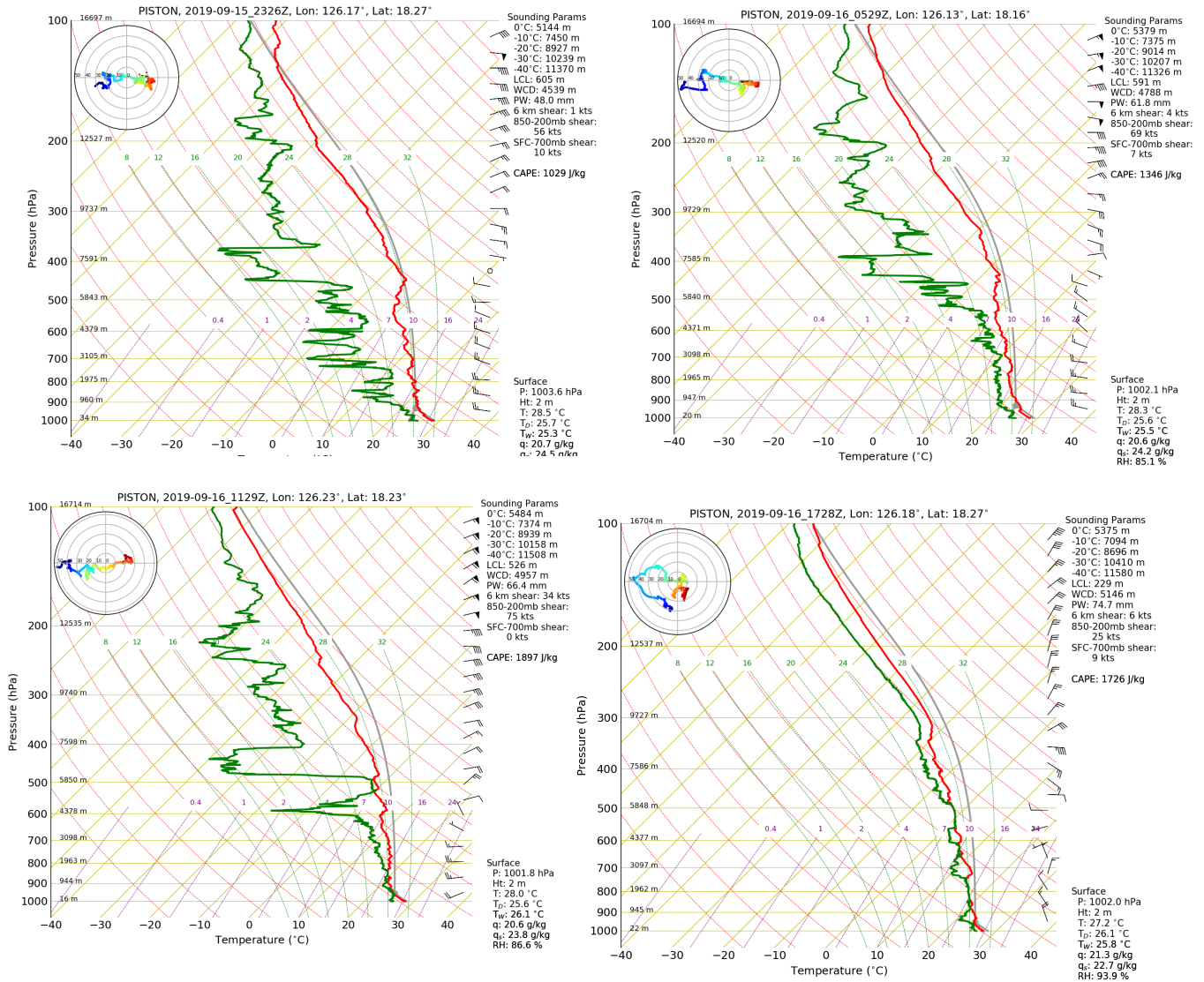


Fig. 1.: 00,06,12,18Z Soundings

SEAPOL 2019-09-16 02:50:09 PPI 0.80°

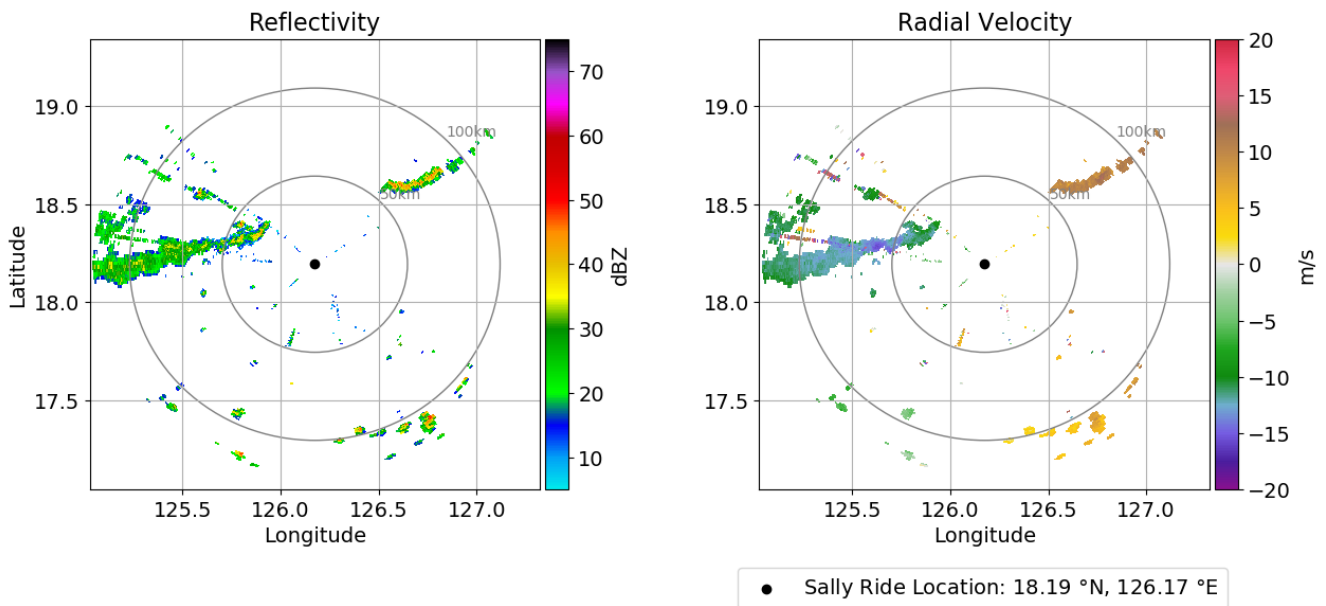


Fig. 2: Thin line of showers which passed over the ship early in the day (the break in the line to the north is from the blanking sector)

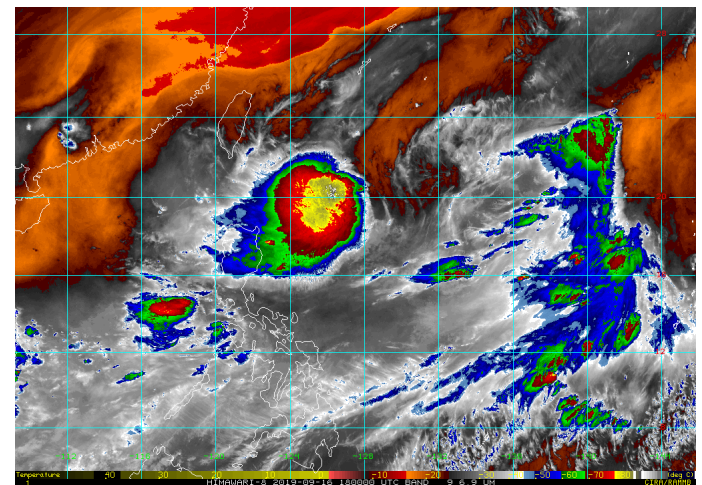
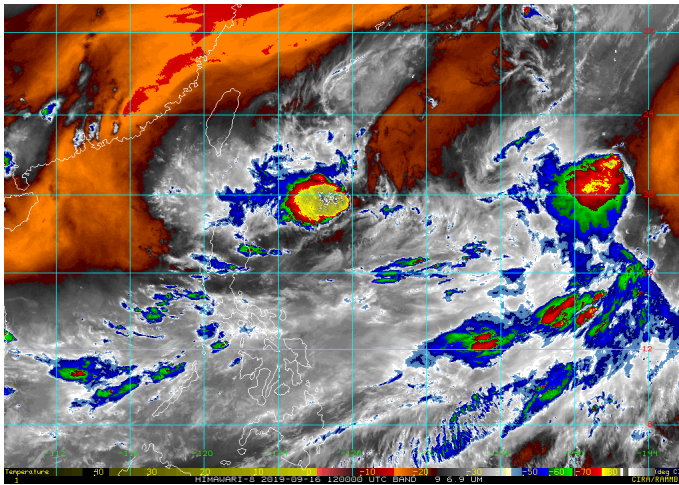
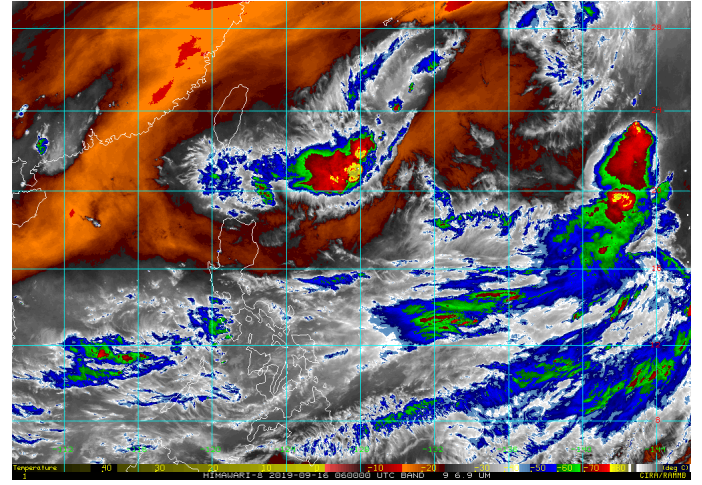
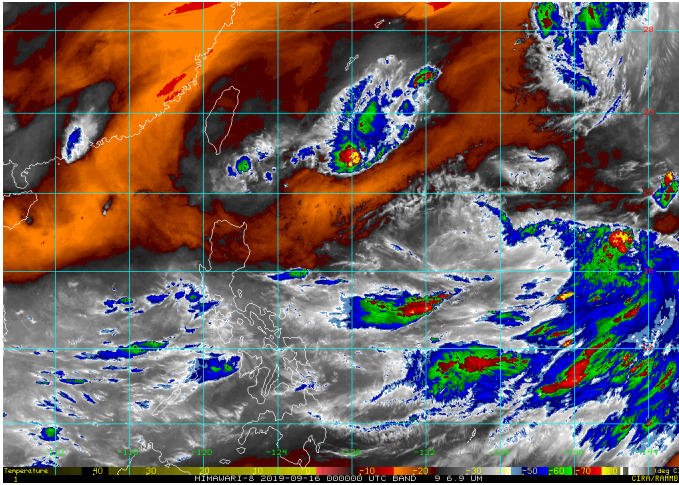


Fig. 3: Water vapor satellite imagery at 00Z (top left) 06Z (top right) 12Z (bottom left) and 18Z (bottom right).

SEAPOL 2019-09-16 15:30:08 PPI 0.80°

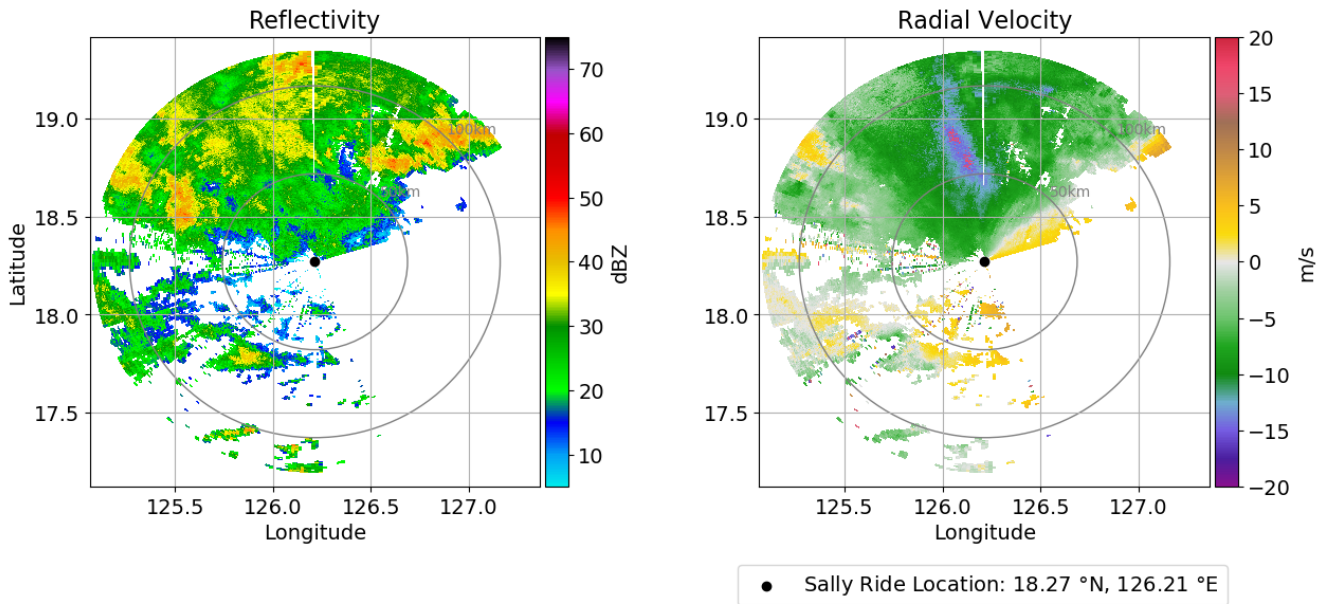


Fig. 4: Radar image as precipitation began at the ship

SEAPOL 2019-09-16 18:40:07 PPI 0.80°

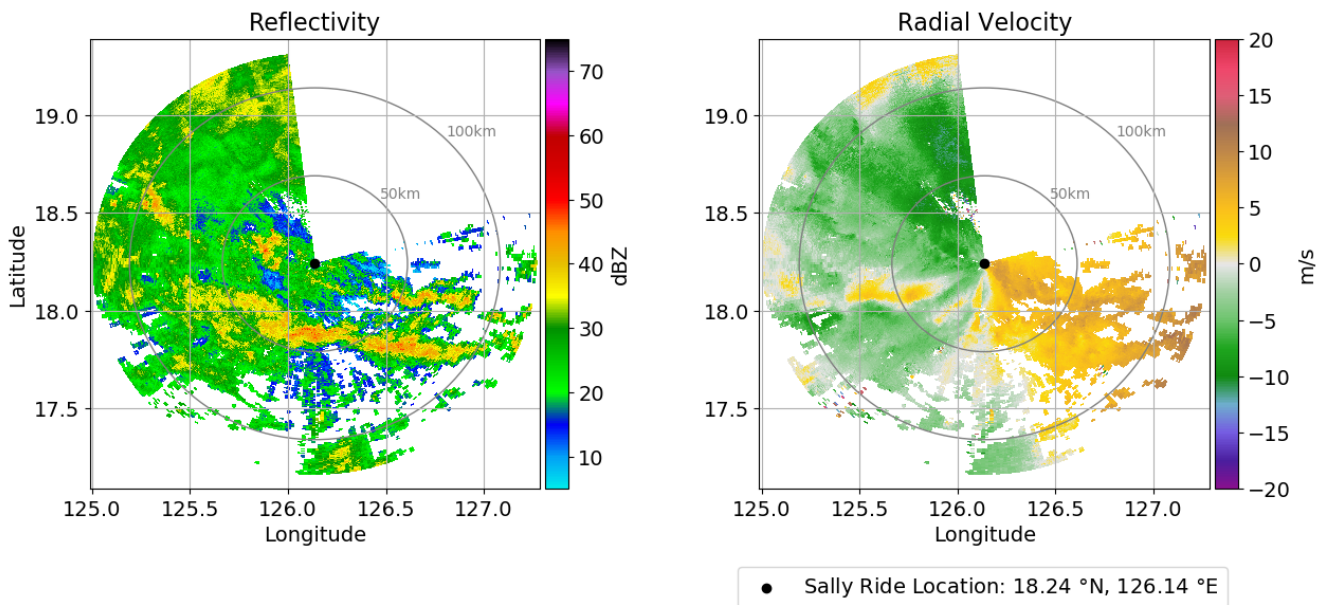


Fig 5: Radar image of a stronger line which emerged from the stratiform (17.9 N, 126-127E)