

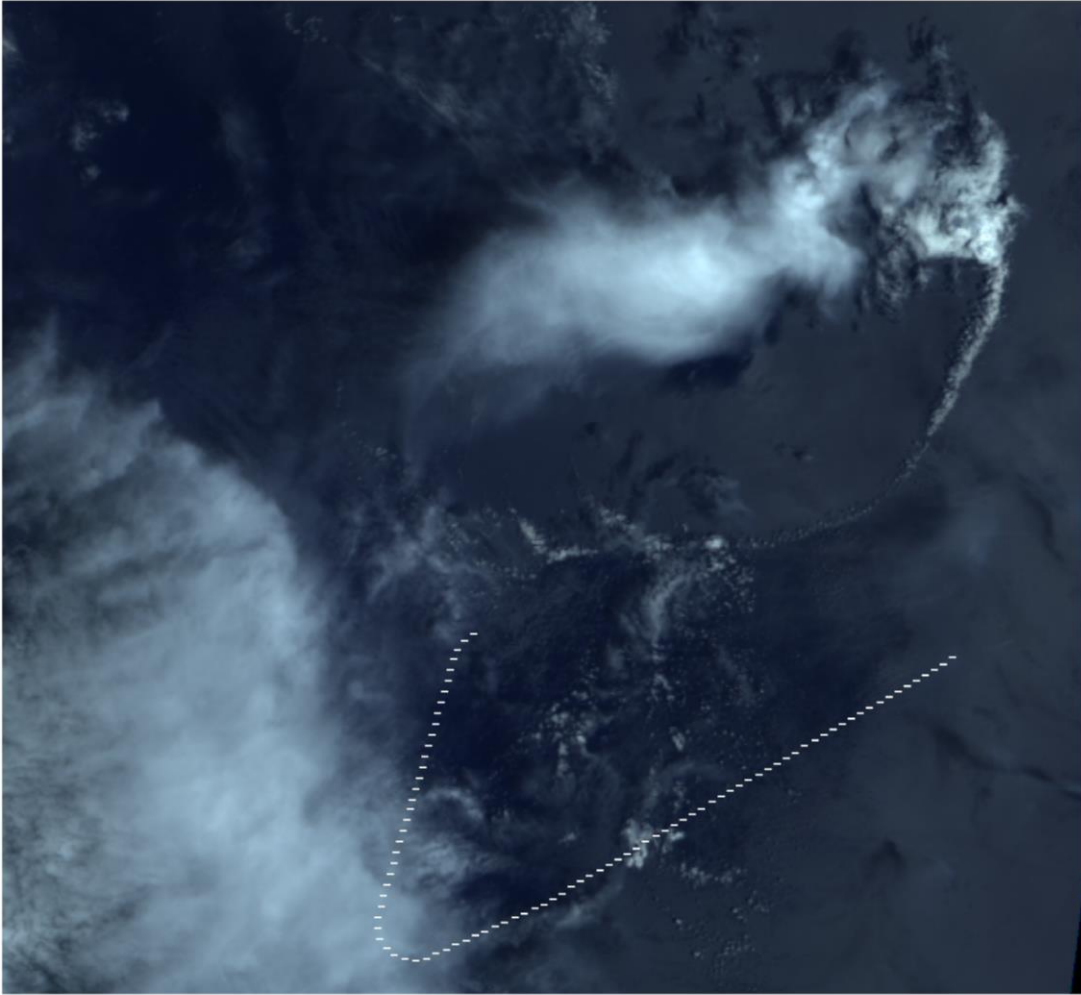


RF 07 – Cloud Top Height Visualization & Analysis

Arka Mitra

MISR Multi-Angular Views and Flight Track for Cloud Top Height Analysis

AN

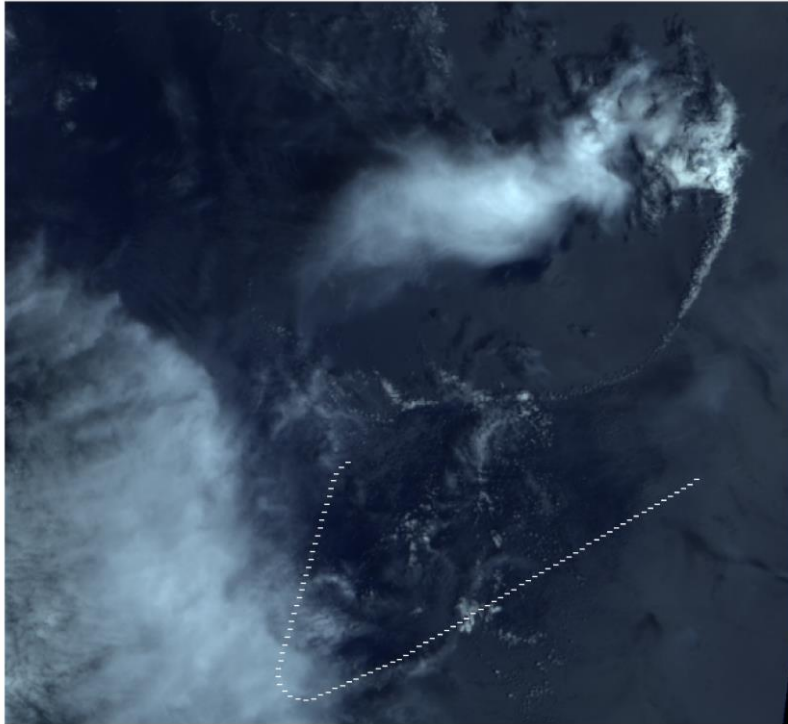


DF

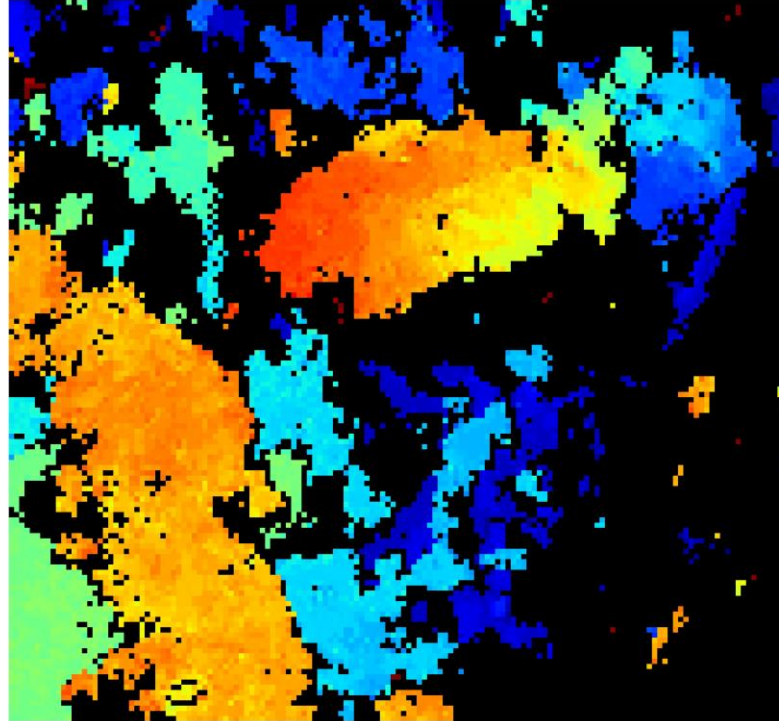


MISR Nadir View and Flight Track vs Cloud Top Height Estimates

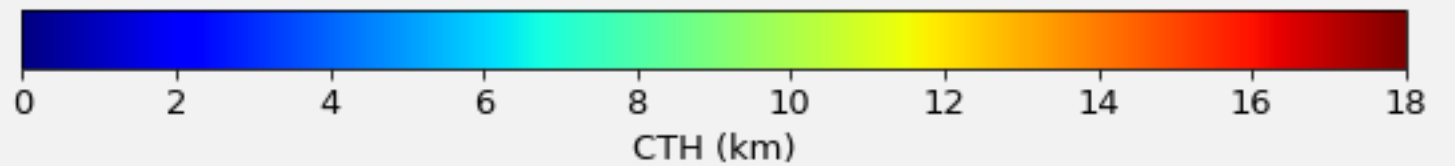
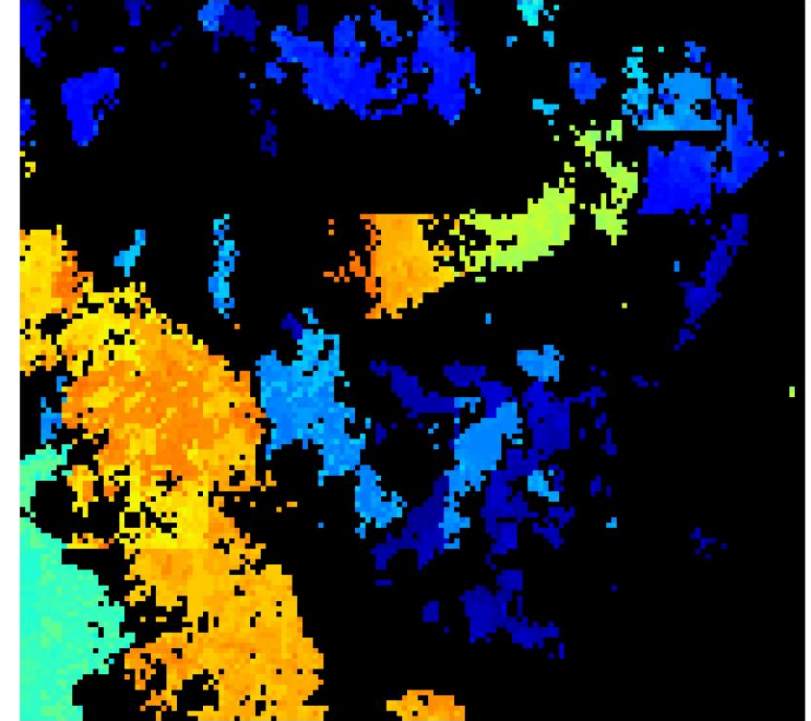
AN



Without Wind Correction (1.1 km)



With Wind Correction (1.1 km)

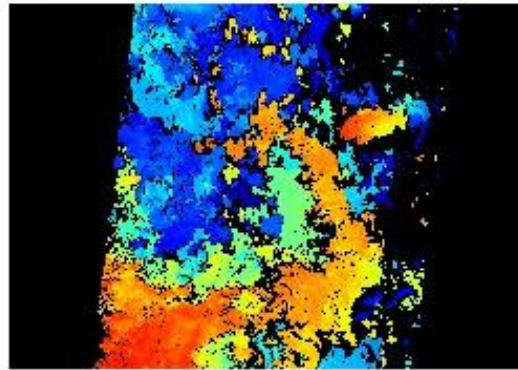


Unprojected

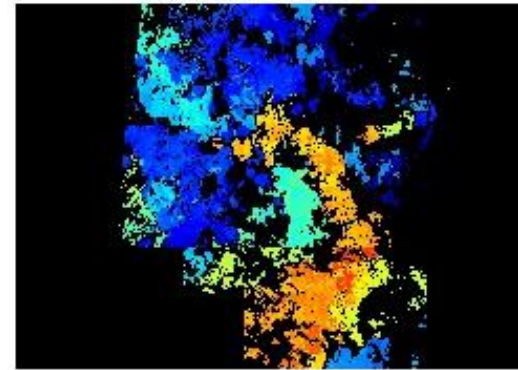
MISR Cloud-Top Height Estimates

Projected with Flight
Track

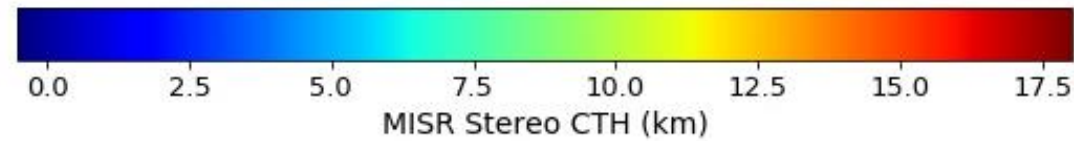
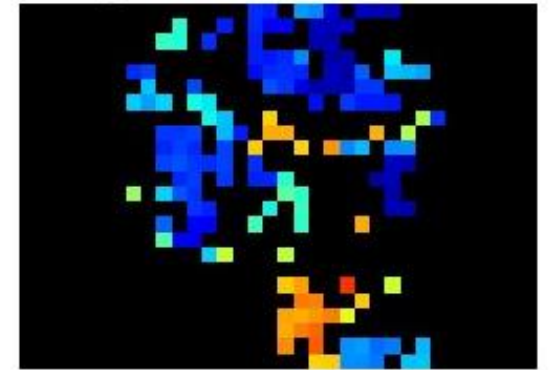
Without Wind Correction (1.1 km)



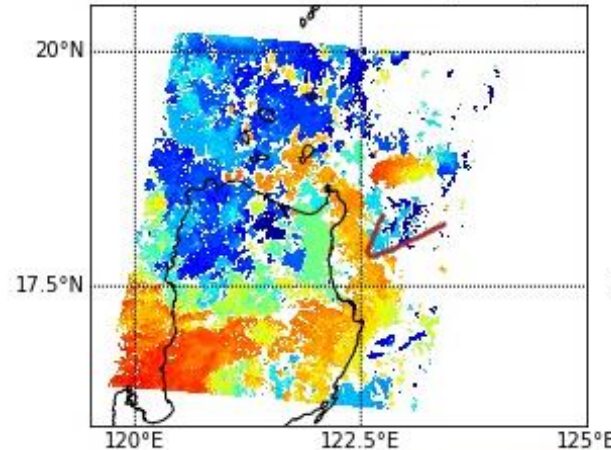
With Wind Correction (1.1 km)



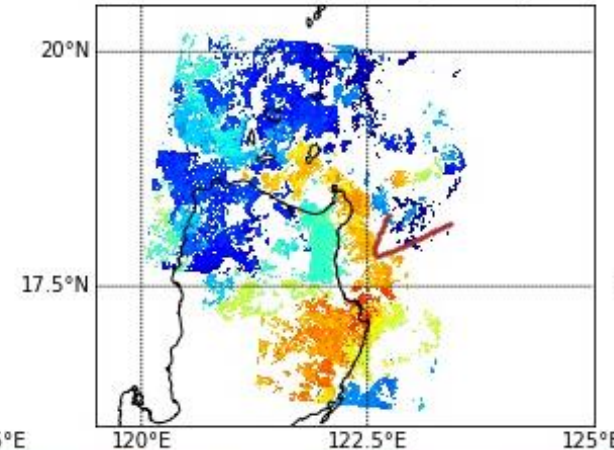
Height of wind retrieval (17.6 km)



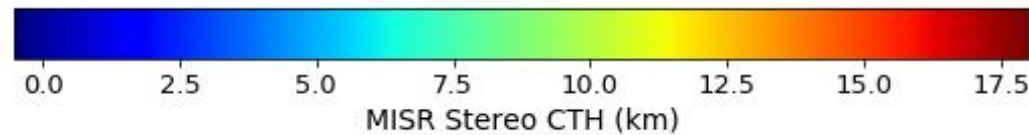
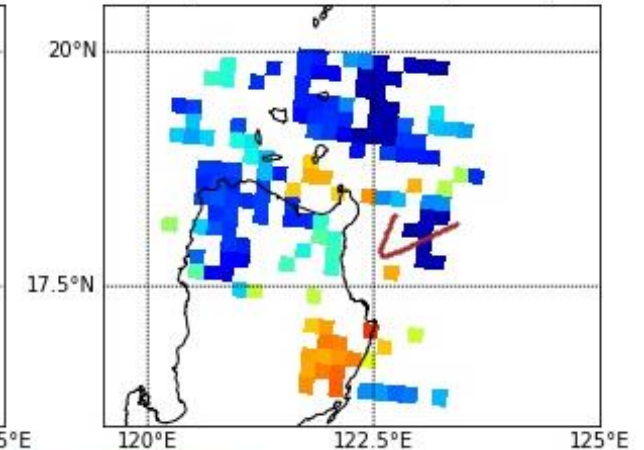
Without Wind Correction (1.1 km)



With Wind Correction (1.1 km)

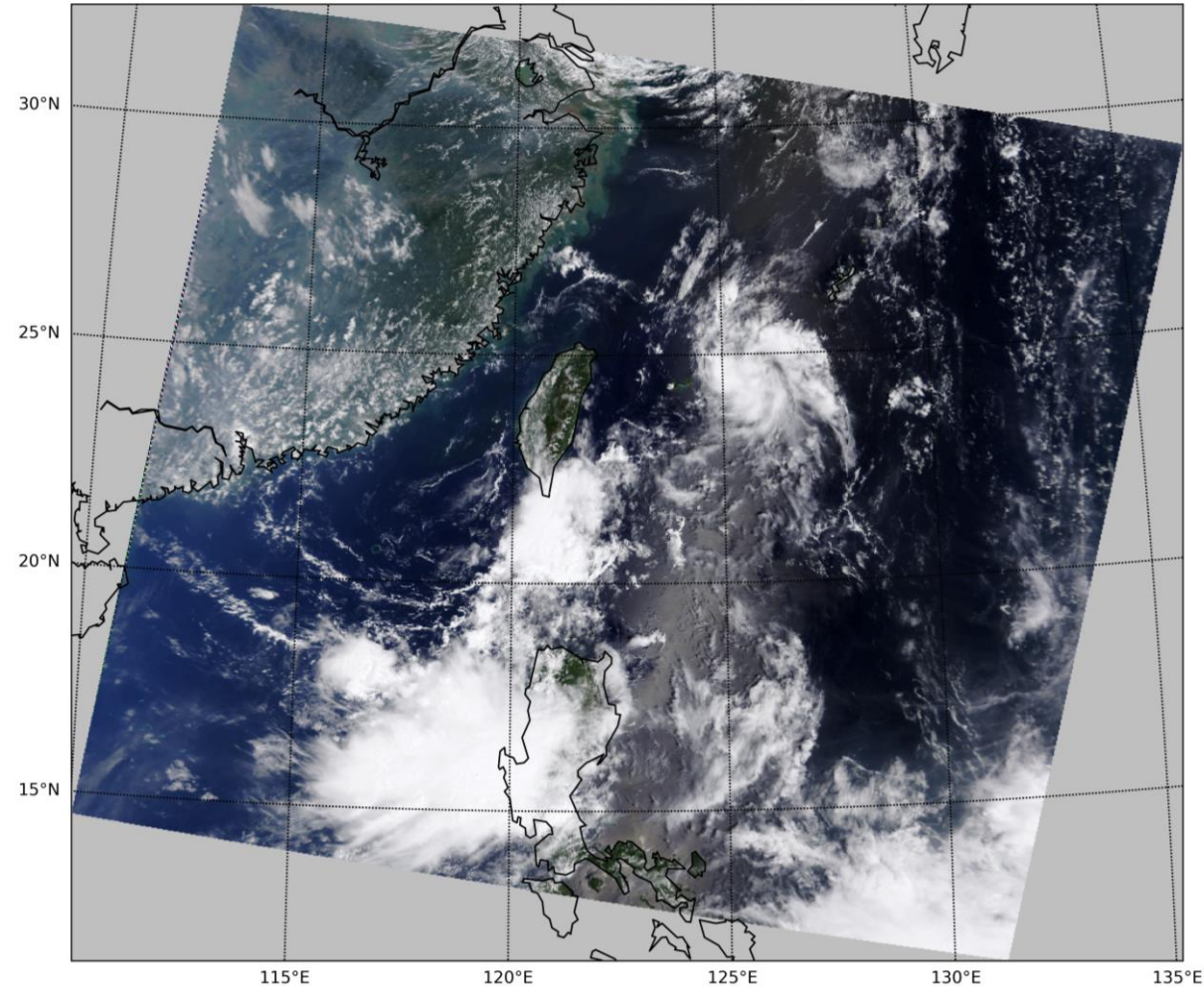


Height of wind retrieval (17.6 km)

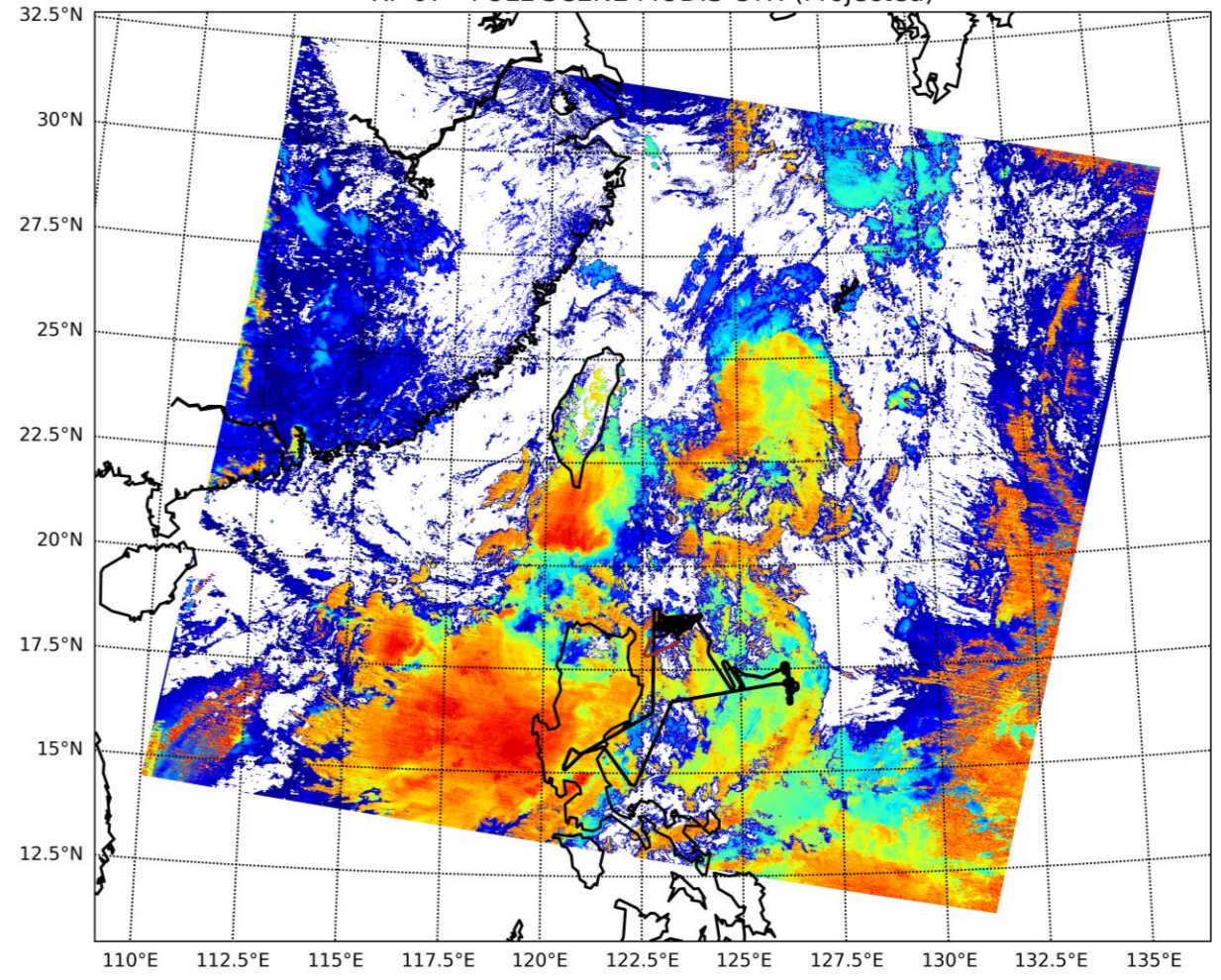


MODIS RGB vs MODIS Cloud Top Height Estimates

RF 07 - FULL SCENE MODIS RGB (Projected)

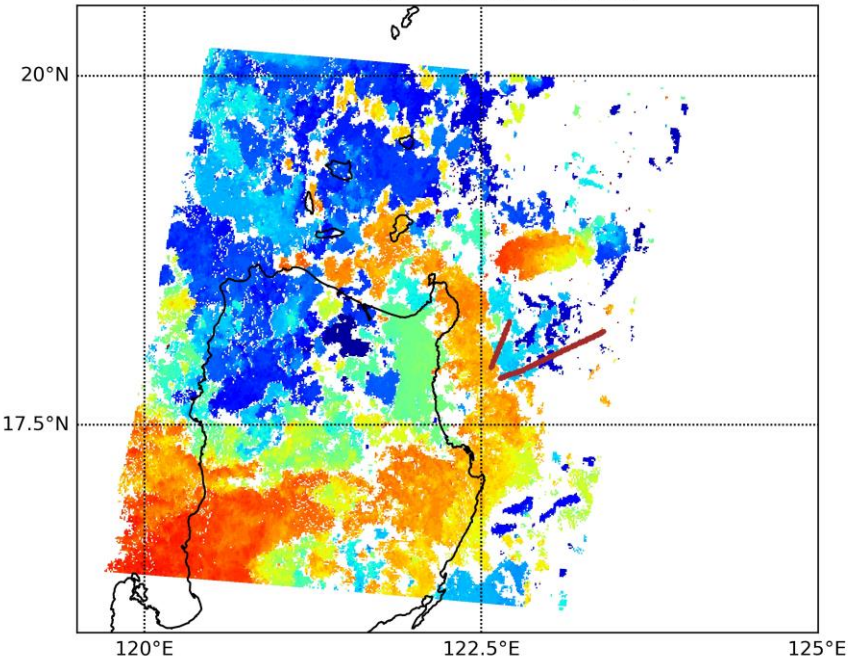


RF 07 - FULL SCENE MODIS CTH (Projected)

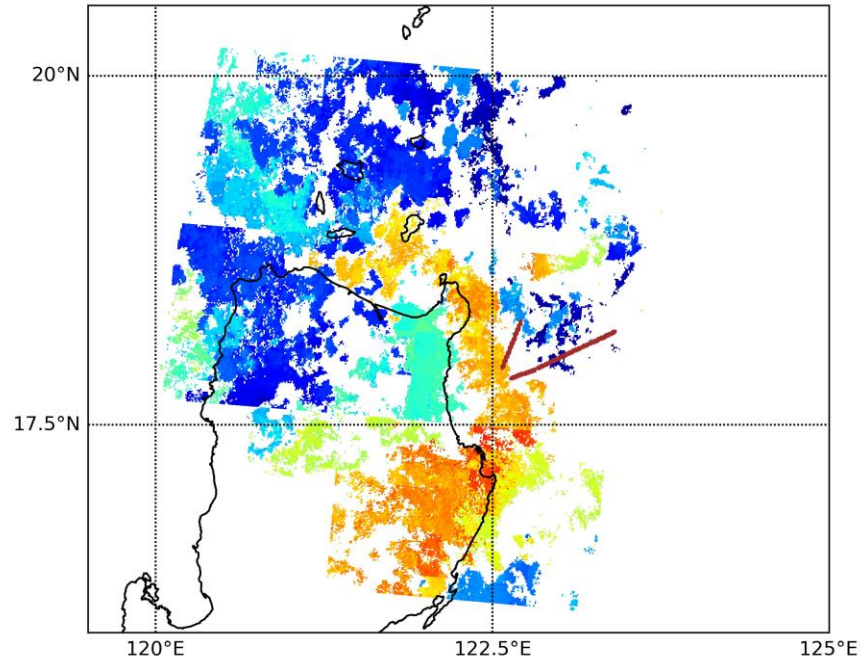


MISR vs MODIS Cloud Top Height Estimates

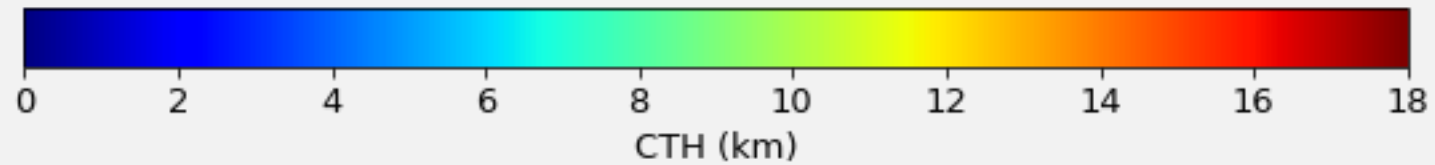
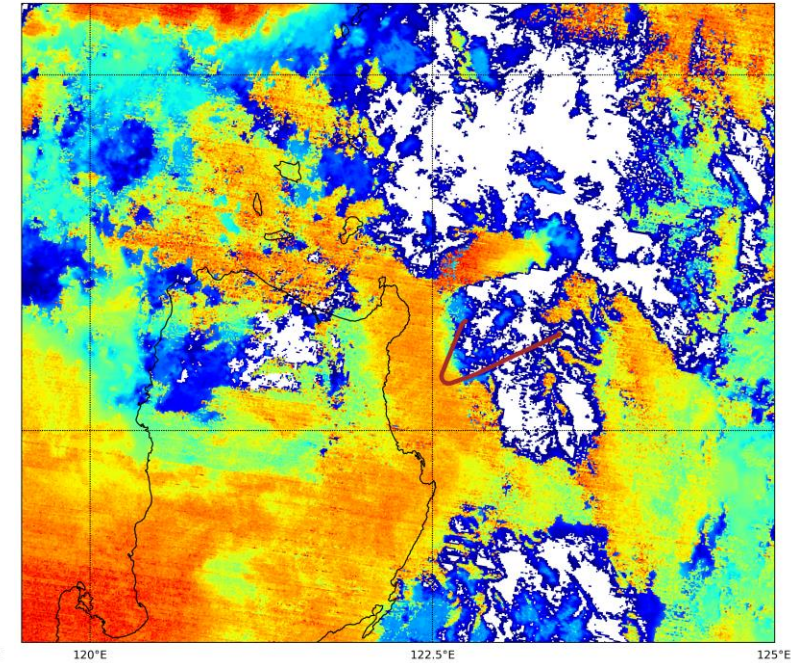
Without Wind Correction (1.1 km)



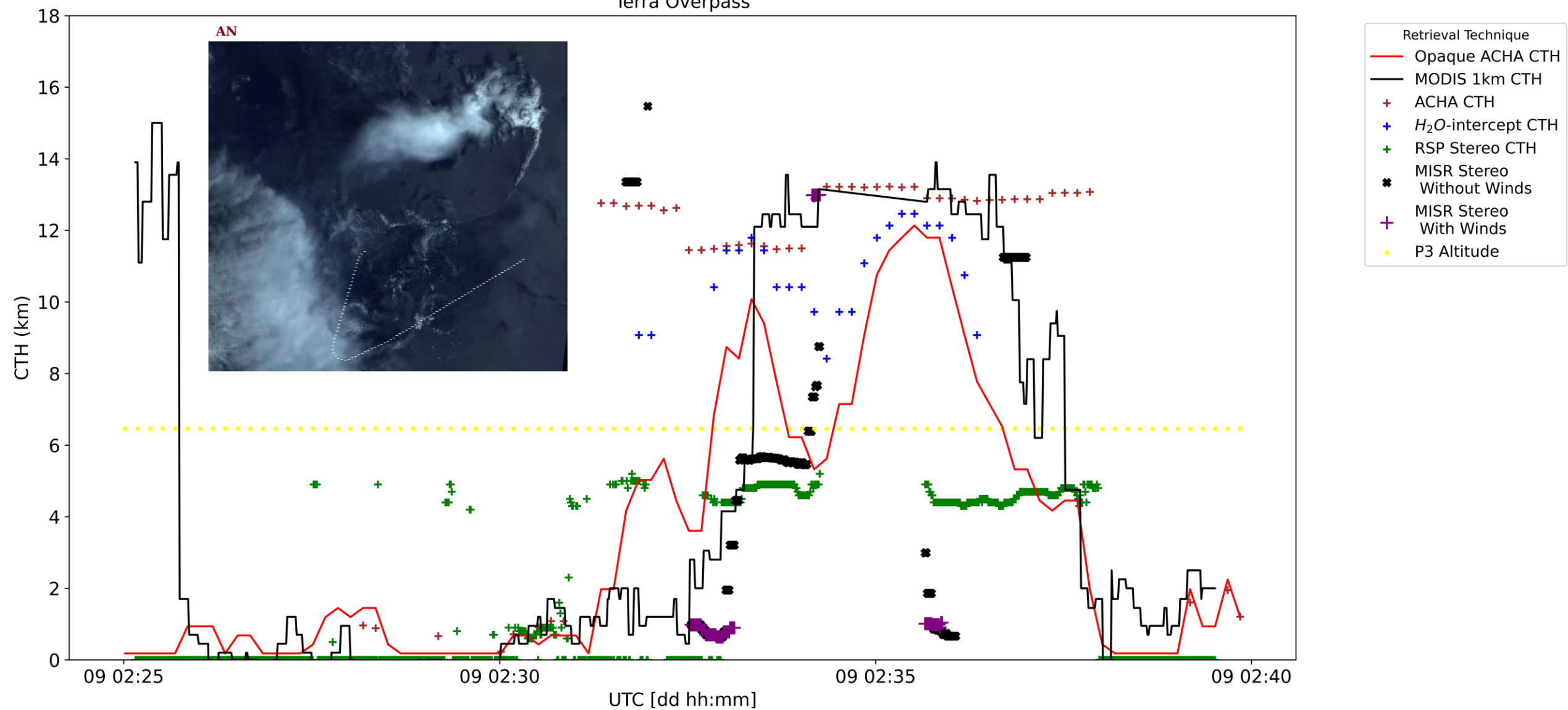
With Wind Correction (1.1 km)



MODIS CTH



Terra Overpass

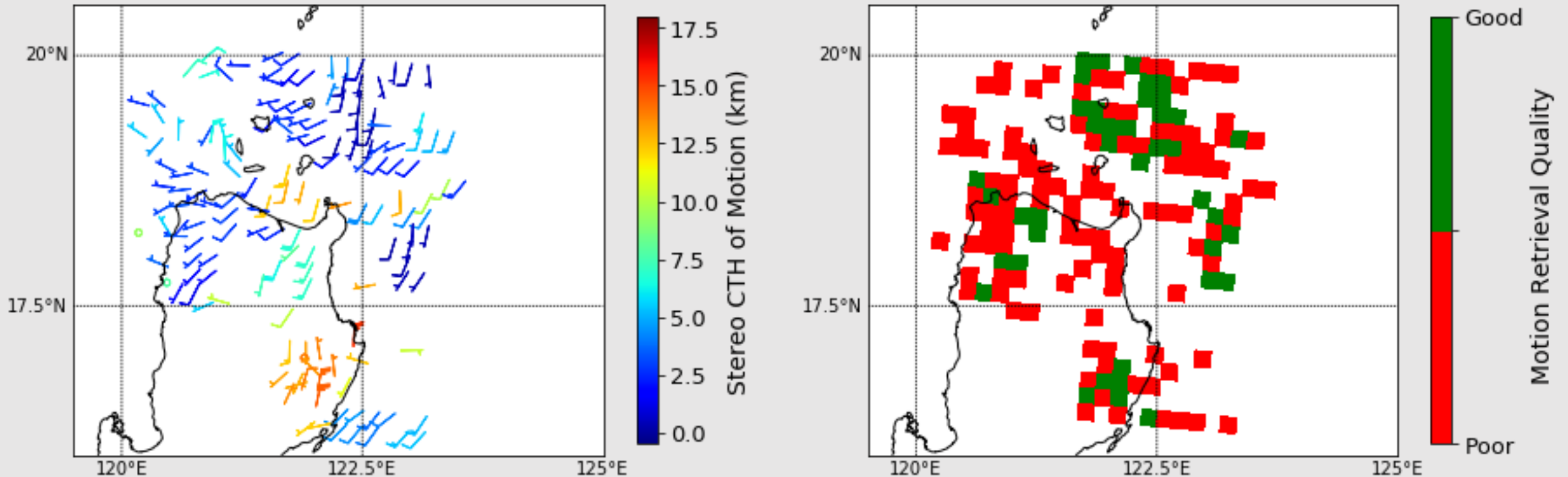


MISR Single-Layered Low Cloud CTH Error (from earlier research) :

Bias Error --> -328 m (Excepting possible lidar bias, Wind-retrieval bias + Stereo Bias)

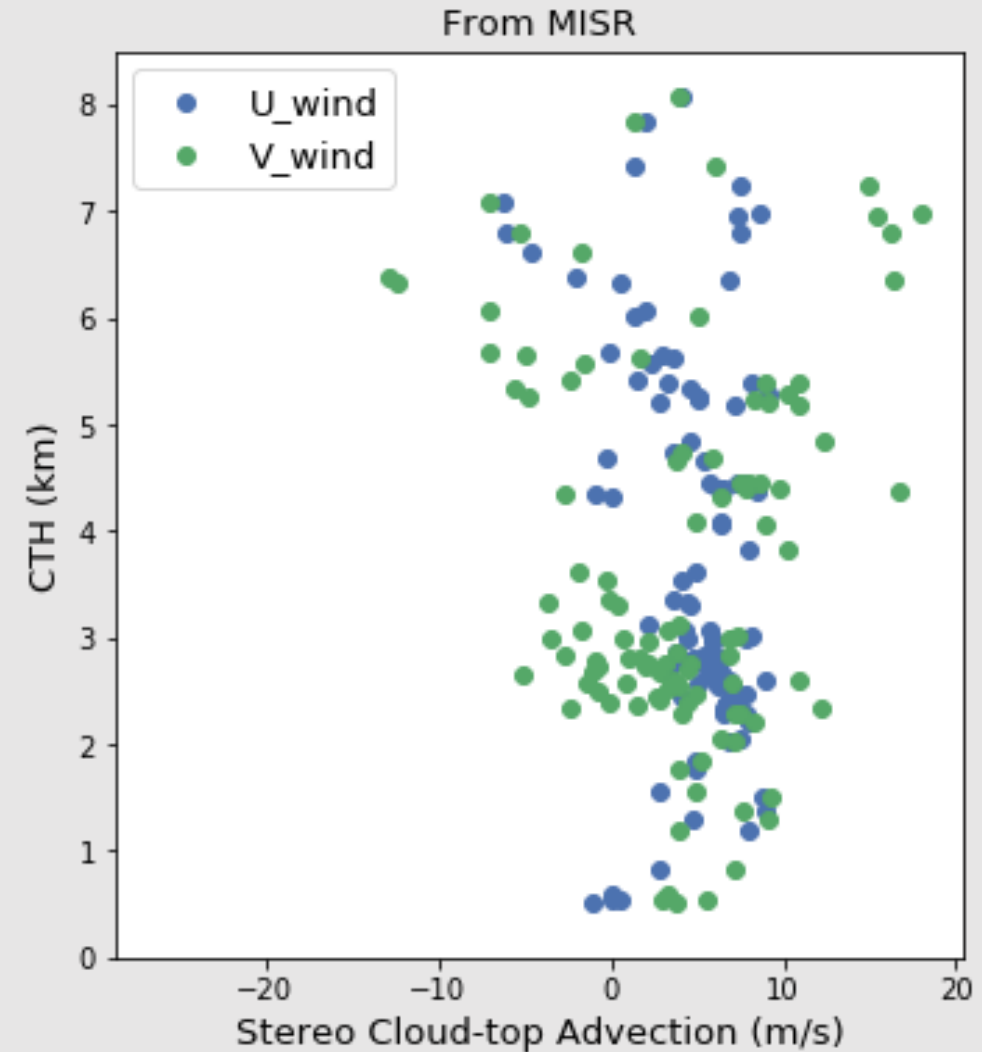
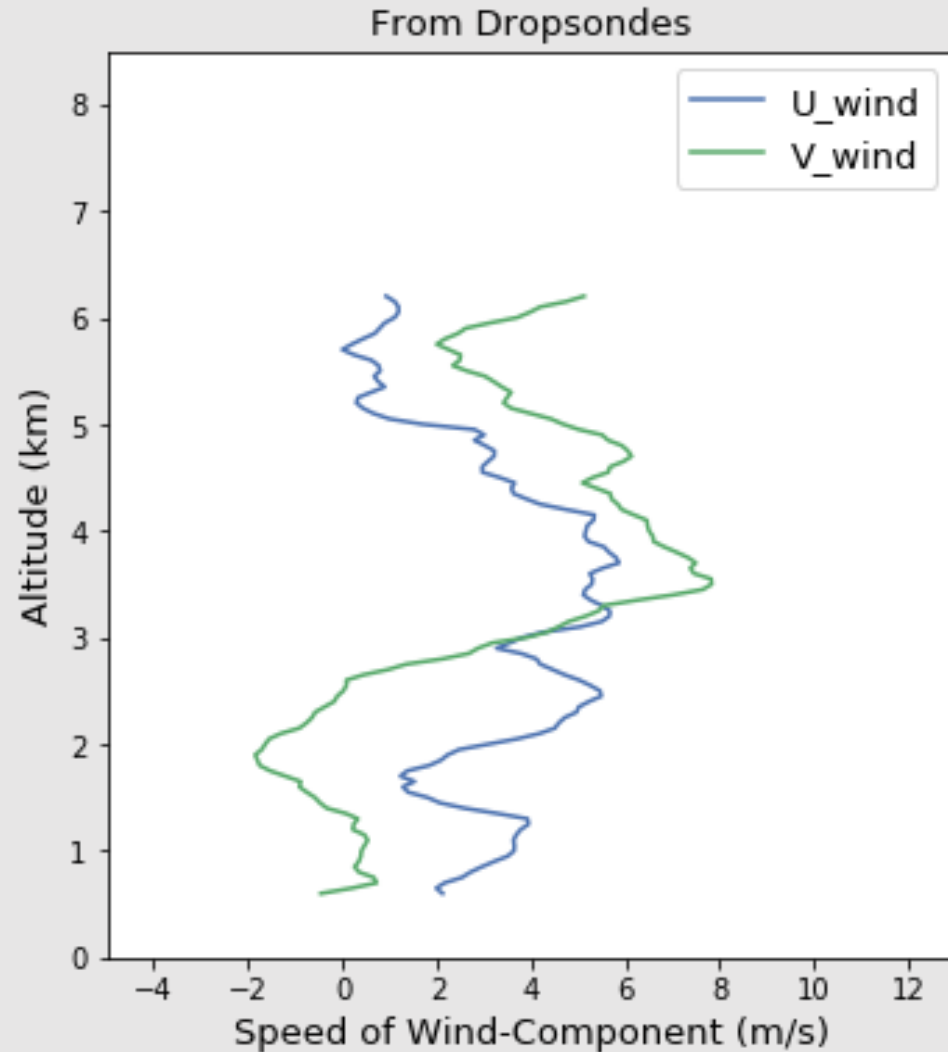
RMS Error --> 532 m (Random wind-related errors, Navigation errors, Geolocation Errors)

Wind Retrieval Bias (Possible verification from CAMP2Ex – Dropsondes & APR-3 Doppler Velocities)

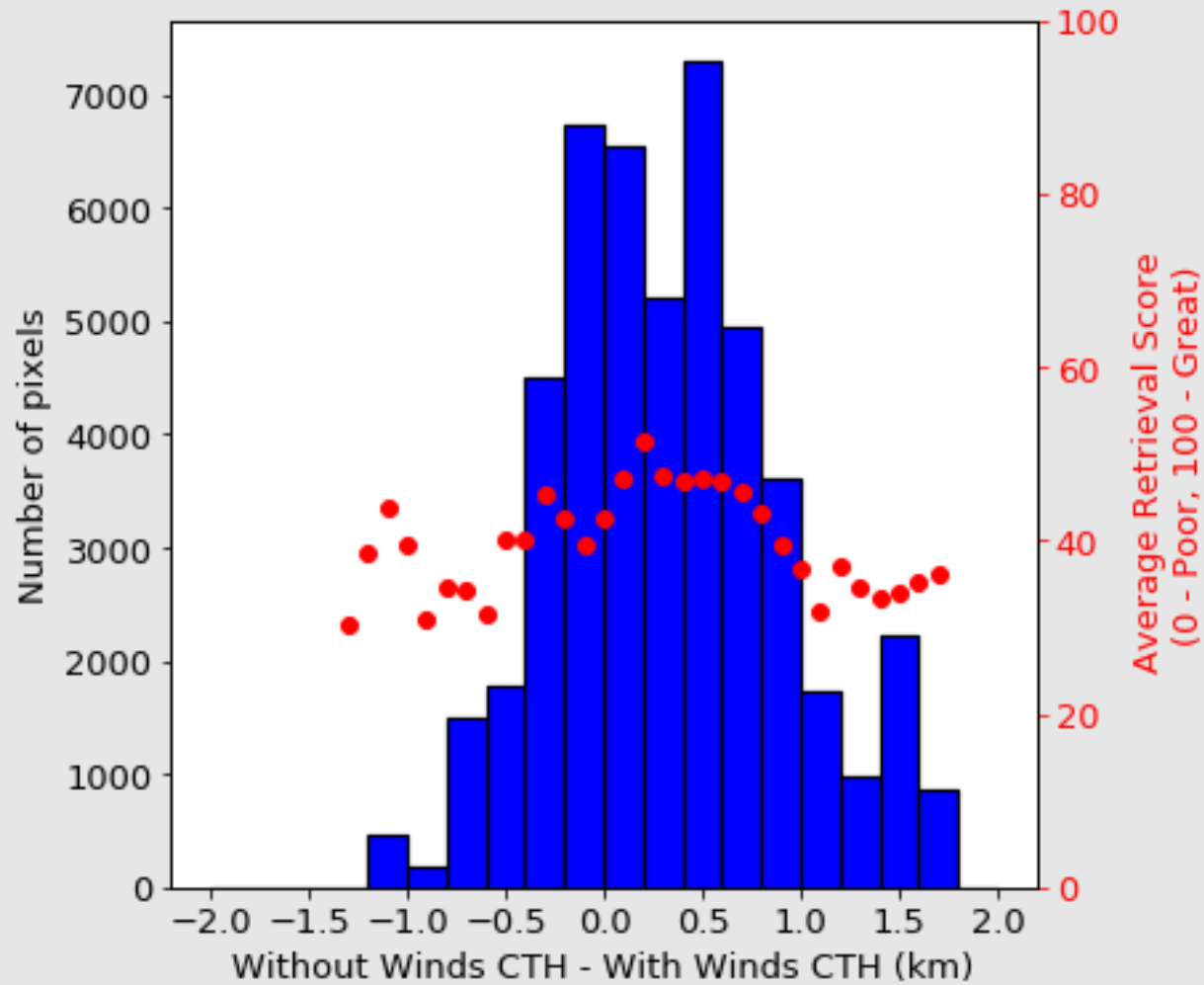


3 dropsondes were deployed close to the tight coordination between Terra and the P3 aircraft
– 0217, 0222, 0230 UTC.

Constructed an average wind-component profile with height from these dropsonde data.
Compared MISR winds with winds from this profile.

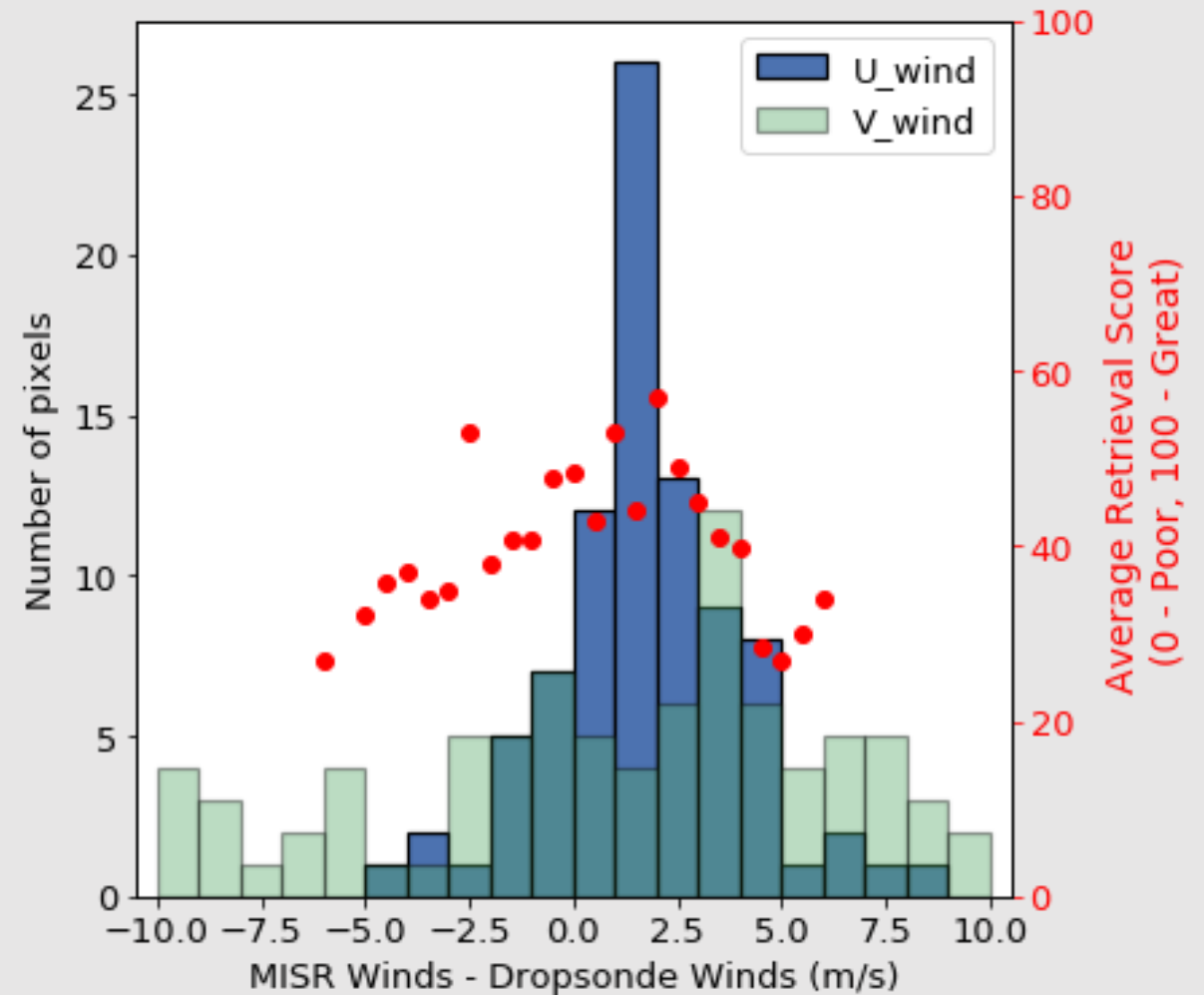


CTH Wind-Correction Changes



Mean/STD of (without winds - with winds) CTH : 0.247 km, 0.734 km
 Max/Min of (without winds - with winds) CTH : 1.781 km, -2.44 km
 Δ (CTH) for maximum cloud motion accuracy : 0.2 km

Wind Retrieval Errors



Mean/STD of Easterly Wind Errors : 1.768 m/s, 2.274 m/s
 Mean/STD of Northerly Wind Errors : 1.355 m/s, 5.424 m/s