

MISR Cloud/Aerosol and Their Variability Through ENSO

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Decadal observations of cloud/Aerosol from Terra MISR are investigated to characterize tropical low cloud amount and Asian dust and their responses to ENSO (El Niño Southern Oscillation). The MISR stereo technique has been unique with little dependence on atmospheric thermal structure and surface type in measuring cloud and aerosol. Despite a similar morphology of low cloud cover in the Pacific basin among MISR, MODIS (MODerate Resolution Imaging Spectroradiometer), and ISCCP (International Satellite Cloud Climatology Project), MISR cloud fraction shows the sharpest trade cumulus pattern along the equatorial Pacific. During the warm phase of ENSO, the observed low cloud cover generally decreases in the central Pacific near equator and increases in the subtropics and in the Southeastern (SE) Pacific. To characterize the Asian Dust distribution, three different areas, Taklimakan, Central Gobi, and East Gobi, are chosen as major Asian dust source regions. Despite differences, the ENSO driven aerosol optical thickness (AOT) anomalies from MISR, MODIS Deep Blue-Aqua and OMI (Ozone Monitoring Instrument)-Aqua are physically consistent in three independent satellite-based AOT observations. Asian dust loading is increased during La Nina years, and relatively cold and dry winters are suggested as a favorable condition for the dust production.