Zhiquan
Liu
National Center for Atmosphere Research
Junmei Ban, National Center for Atmosphere Research
Ivette Hernandez Banos, National Center for Atmosphere Research
Kate Fossell, National Center for Atmosphere Research
Byoung-Joo Jung, National Center for Atmosphere Research
Chris Snyder, National Center for Atmosphere Research
Oral
MPAS-JEDI, a data assimilation (DA) system for the Model for Prediction Across Scales – Atmosphere (MPAS-A) based upon the Joint Effort for Data assimilation Integration (JEDI), allows to assimilate all-sky satellite radiance data to analysis microphysical parameters, e.g., mixing ratios of hydrometeors. Global cycling DA experiments were conducted in the context of MPAS-JEDI's hybrid-3DEnVar configured at 30km resolution. The benchmark experiment assimilates conventional observations plus clear-sky radiances from AMSU-A and MHS. All-sky experiments add the assimilation of all-sky radiances from AMSU-A's and/or ATMS's window channels over water. The impact of assimilating all-sky microwave data on cloud forecasts is evaluated using GOES-ABI and Himawari-AHI infrared radiance data at different wavelengths. The community radiative transfer model (CRTM) is used as the observation operator in both all-sky radiance data assimilation and evaluation. The significant positive impact on cloud forecasts was obtained with all-sky microwave DA in terms of a better forecast fitting to observed AHI/AHI radiances, especially over tropical regions, where the day-1 forecast root-mean-square error is reduced up to 10%.
Presentation file
Liu-Jake-dod-2023.pdf
YouTube link
View recording
Meeting homepage
DoD Cloud Post-Processing and Verification Workshop
Download to PDF