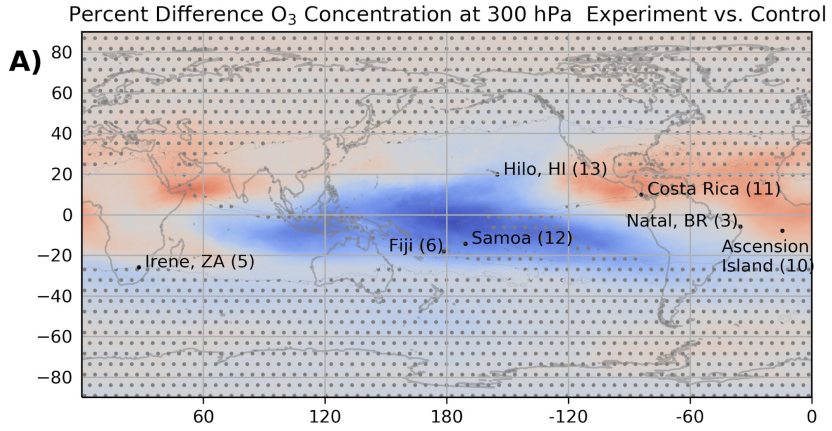
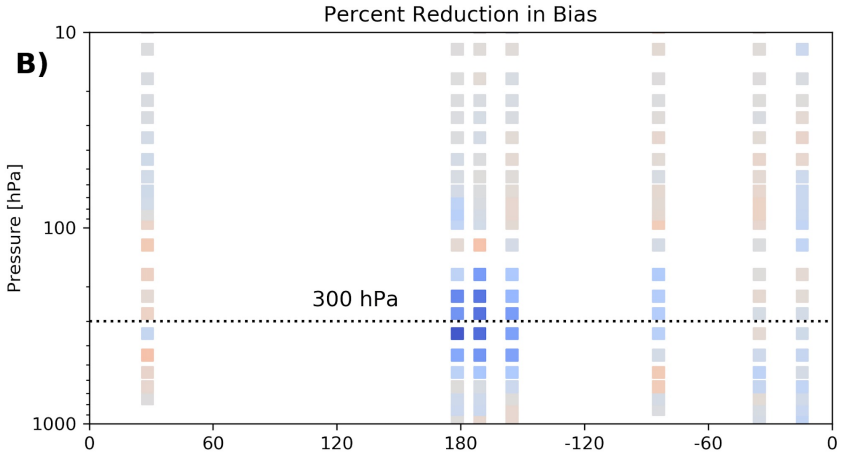
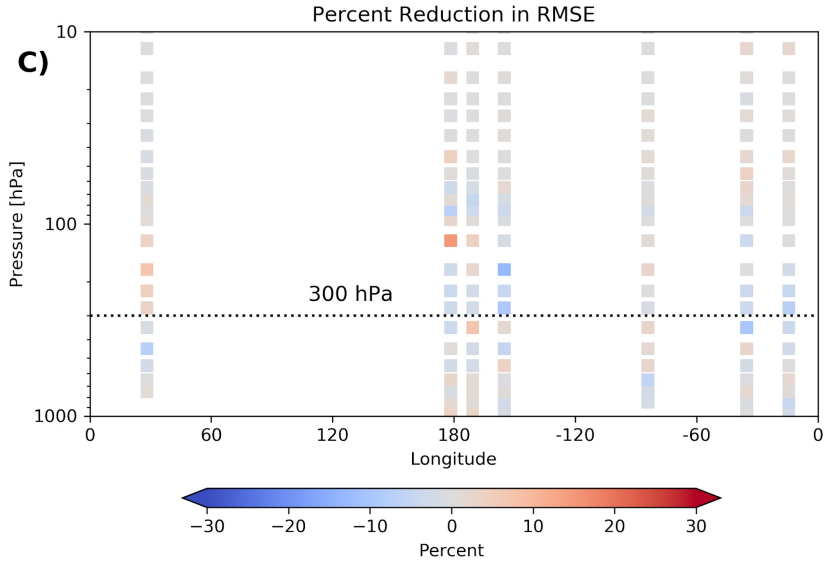
Investigating the utility of hyperspectral sounders in the 9.6μm Band to improve ozone analyses



An observing system experiment is conducted using the Global Earth Observation System-Atmospheric Data Assimilation (GEOS-ADAS). This involves running the GEOS-ADAS with 9.6 μm band observations from AIRS, CrIS and IASi along with a control run of the GEOS-ADAS without 9.6 μm band observations. The percent difference in mean ozone concentration for August–September 2018 at 300 hPa between the experiment analysis and control (shown in Panel A) shows an enhancement of the tropical wave-1 ozone feature (stippling below 95% confidence). In-situ ozonesonde observations available from SHADOZ are used for validation purposes and show an overall reduction in bias and RMSE in the UTLS (shown in blue in B and C).





(A) Percentage O_3 difference 9.6 μm experiment vs control along with percentage reduction of (B) bias and (C) RMSE against SHADOZ ozonesondes for the 9.6 μm experiment.