

Assimilation and Forecast Impact of High Temporal Resolution Leo/Geo AMVs in the High-Latitude Data-Gap Corridor

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Abstract

A data-gap region exists for atmospheric motion vectors (AMVs) at 60° – 70° latitude in both hemispheres, which is too far poleward for current geostationary imagery and too far equatorward for polar-orbiting imagery. GOES-R has the capacity to address this AMV data-gap corridor with higher spatial and temporal resolution geostationary satellite data that extends further poleward, expanding the range of AMV data into these regions and allowing for wind datasets to be constructed as often as four times per hour.

Assimilation strategies must be devised for AMVs that exist between the traditional geostationary and polar-orbiting AMV boundaries, since the quality control of these two types of AMVs have been treated separately for some time. CIMSS has the capacity to address this issue through the implementation of combined geostationary/polar-orbiting satellite data (Leo/Geo) produced at the 15-minute frequency expected from GOES-R, incorporating higher-resolution polar orbiting imagery data where it is available, producing AMVs in the data-gap corridor at higher fidelity than is currently capable with pre-GOES-R geostationary imagery. Thus, the current Leo/Geo winds product can be used as a proxy for future high-latitude, frequent-temporal GOES-R AMVs.

We propose to investigate the assimilation of Leo/Geo AMVs in NCEP's global (GDAS/GFS) model, with the purpose of reconciling assimilation-strategies and quality control across the AMV data-gap corridor, which will be beneficial when transitioning to the use of GOES-R imagery data. The combination of migrating the Leo/Geo AMVs production into NESDIS operations and providing a tested protocol for the assimilation of GOES-R AMVs in the data-gap corridor is expected to provide positive impact at low cost and little additional infrastructure.