

Development and Optimization of Mesoscale Atmospheric Motion Vectors (AMVs) using Novel GOES-R Processing Algorithms on 1-5 min. SRSO Proxy Data, and Demonstration of Readiness for GOES-R Applications via Impact Studies in Mesoscale NWP Systems

Principal Investigators: Christopher Velden (CIMSS), Stephen Weygandt (NOAA-ESRL), Jaime Daniels (NESDIS-STAR)

Abstract

One of the principle benefits expected from GOES-R is the improvement in temporal sampling of images from the ABI (Schmit et al. 2013). In addition to qualitative uses by forecasters, the rapid refresh (1-5 min.) should allow for quantitative improvements in derived products normally associated with geostationary satellite imagery. One of those products is atmospheric motion vectors, or AMVs. Derived by tracking coherent cloud motions in successive VIS/IR images, AMVs have long stood as an important contributor of tropospheric wind information to analyses on the global scale (Velden et al. 2005). GOES-R will allow superior cloud-tracking and AMV generation on time scales not only useful for global applications, but for mesoscale applications as well.

The reasons we are optimistic that GOES-R AMVs can be an important contributor to mesoscale analyses derive from recent and ongoing studies (Bedka and Mecikalski, 2005; WMO, 2012; Velden et al. 2013; Rabin et al. 2013; Wu et al. 2013). We plan to build on these pioneering efforts as we also take advantage of GOES-R capabilities and new AMV derivation methods (Bresky et al. 2012). Then apply these to the production of mesoscale AMV datasets with the goal of extracting wind information that benefits short-term forecasts and operational NWP.