

An Improvement of Height Assignment Method on CPTEC's Wind Estimation Algorithm for GOES-16

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The satellite estimation of cloud top height is an essential ancillary variable for the derivation of satellite winds, commonly known as Atmospheric Motion Vectors (AMVs), which are later assimilated into numerical weather models to provide a diagnostic of the atmosphere. An important driver of the uncertainty of the AMVs is the height assigned to each vector, which are estimated by different algorithms according to each satellite's capabilities and physical assumptions made. The goal of this study is to compare the operational height assignment algorithms for AMVs being used in Brazilian Center for Weather Forecasting and Climate Studies (CPTEC) with state of the art techniques for the Geostationary Operational Environmental Satellite version 16 (GOES-16). The generation of GOES-16 products by CPTEC provides its faster deployment and adaptation for South American applications. The analysis will include the improved treatment for multilayer and semitransparent clouds, the optimal estimation methods' advantages, and the reduction of assumptions on cloud microphysics. Another aspect of this work is to evaluate the estimation of cloud heights with the subset of pixels relevant to AMV tracking schemes. It is expected better results from the state of the art pixel-based cloud retrieval algorithms, that also will be faced to observations from Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation (CALIPSO). The newest algorithm takes advantage from the improved spectral resolution of GOES-16, that is operational in 75.2 degrees west since December of 2017.

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