ABSTRACT

Title: Towards the Handing of Cloud-Affected Infrared Radiances in the GSI

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In the gridpoint statistical interpolation (GSI) data assimilation algorithm, only thermal infrared measurements determined to be uncontaminated by clouds are assimilated. Using this approach, typically only 10-20% of footprints are deemed to have no cloud affects through the measured spectra. This study will discuss the efforts underway at the Global Modeling and Assimilation Office (GMAO) at NASA Goddard Space Flight Center, in conjunction with the Joint Center for Satellite Data Assimilation (JCSDA), to actively assimilate these more-complicated observations by using a graybody assumption. In the GSI, cloud top pressure and effective cloud amount are retrieved concurrently using a minimum residual method. This study will address the limitations and advantages of the technique and the modifications underway to the assimilation system to incorporate those two parameters into the radiative transfer forward operators and TL/AD calculations. Furthermore, it will explain the efforts underway to incorporate these parameters into the control vector so that they can be altered variationally as part of the minimization.

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