9TH EUROPEAN
CONFERENCE ON

9th EMS Annual Meeting
Applications of Meteorology
High resolution meteorology
- applications and services

Cloud Property Retrievals from Geostationary Satellites for Aviation Weather Applications

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A near-real time analysis system has been developed to retrieve cloud and radiation properties from operational geostationary satellite imager data. It is currently being applied to GOES-11/12, Meteosat-9, and MTSAT-1R, as well as to polar orbiting satellite imagers. The North American domain, which includes much of Canada, the USA, and Mexico, is analyzed each half hour using data from GOES-11 and 12. Selected cloud properties including cloud phase, effective particle size, top and base heights, optical depth, and ice/liquid water path are made available digitally for use in an aircraft icing potential product and in numerical weather prediction model assimilation. In addition to their use in the Current Icing Potential Product, the analysis system generates a nowcasting aircraft icing index and estimate of ceiling heights. Recent advances to these analyses include improved nighttime retrievals and daytime multilayer cloud retrievals. The latter has significantly increased the amount of usable data for detection of icing conditions. These products and many others are also made available online in digital and image formats for use by other researchers, forecasters and the public. This paper will present examples of the results and validation efforts to date.