

Assessment and Enhancement of the Cloud Emission and Scattering Index (CESI) for Detecting Cirrus Clouds

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The Cloud Emission and Scattering Index (CESI), developed by Lin et al., (2017), used the double CO₂ absorption band of the Cross-Track Infrared Sounder (CrIS) to detect different layers of clouds. In this study, we assess the performance of CESI in detecting cirrus clouds by using co-located Visible/Infrared Imager Radiometer Suite (VIIRS) Cloud Mask product. By altering the fixed FAR (False Alarm Rate) values, different CESI thresholds for cirrus detection were obtained and compared. In addition, Linear Discrimination Analysis (LDA) was used to combine different layer pairs of Longwave Infrared (LWIR) and Shortwave Infrared (SWIR) channels to improve the performance of cirrus detection.

References

Lin, L., X. Zou and F. Weng, 2017: Combining CrIS double CO₂ bands for detecting clouds located in different vertical layers of the atmosphere. *J. Geophys. Res.*, **122**(3), 1811-1827. [doi: 10.1002/2016JD025505](https://doi.org/10.1002/2016JD025505).