A new dust detection methodology and 25-year climatology for the AVHRR with application to VIIRS

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The Advanced Very High Resolution Radiometer (AVHRR) provides more than 25-years of continuous global measurements at visible and infrared wavelengths. As such, data from this series of satellite-based imagers provides the best opportunity for a global climatology of mineral aerosols. However, coarse resolution, limited channels, and challenges in multi-decadal instrument calibration, greatly complicate any effort to develop a reliable dust detection methodology for this instrument. Here we present updates to earlier dust detection efforts with the AVHRR, namely the creation and application of a dust classifier using a support vector machine algorithm. We demonstrate the effectiveness of this new detection methodology for several case studies, and present a new global dust climatology based on the classifier's application over the long-term AVHRR record. Finally, there will be discussion of future dust detection with the next generation NOAA polar orbiting instrument, the Visible Infrared Imager Radiometer Suite (VIIRS), and the combination of VIIRS and AVHRR dust data to create a continuous dust record that extends into the foreseeable future.