EMS Annual Meeting Abstracts,
Vol. 6, EMS2009-591-1, 2009
9th EMS / 9th ECAM

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

A Survey of the Optical Properties of Line-shaped Persistent Contrails over the Contigous United States by Satellite Imagery

D. Duda (1), P. Minnis (2), R. Palikonda (3), and P. Heck (4)

(1) National Institute of Aerospace, Hampton, VA, United States (david.p.duda@nasa.gov), (2) NASA Langley Research Center, Hampton, VA, United States (p.minnis@nasa.gov), (3) Science Systems and Applications, Inc., Hampton, VA, United States (r.palikonda@nasa.gov), (4) University of Wisconsin, Madison, WI, United States (p.w.heck@nasa.gov)

Current research efforts including ACCRI (Aviation-Climate Change Research Initiative) have recognized that improved representations of the microphysical and optical properties of contrail cirrus within regional and global climate models are necessary for a more accurate estimation of the climate effects of persistent contrails. In addition, one of the recommendations of the ACCRI research program is to develop a global climatology of line-shaped contrails detectable with remote sensing methods with information on the associated optical properties of the contrails. Such a database would be a valuable first step towards a more realistic representation of contrails and cirrus within climate models.

An automated contrail detection algorithm and a multi-spectral cloud property retrieval method are used to determine the optical properties (including optical depth and particle size) of persistent contrails over the Contiguous United States (CONUS). The contrail detection algorithm is an extension of the Mannstein et al. (1999) method, and uses several channels from Terra and Aqua MODIS data to reduce the occurrence of false positive detections. The optical property estimates will be summarized in the context of the fractional coverage of surrounding cirrus cloud conditions in the vicinity of the contrails, and the upper tropospheric humidity determined from numerical weather model analyses.