Abstract Details

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Category: Ocean and Atmospheres

Paper ID: 57-OOA-A1344

Title: Characterization of Asian Dust Properties near Source Region during
Asia

Abstract:

Asian dust typically originates in desert areas far from polluted urbar
regions. During transport, dust layers can interact with anthropogenic
and soot aerosols from heavily polluted urban areas. Added to the co
effects of clouds and natural marine aerosols, dust particles reaching
marine environment can have drastically different properties than tho
the source. Thus, understanding the unique temporal and spatial vari
of Asian aerosols is of special importance in regional-to-global climate
such as radiative forcing, the hydrological cycle, and primary biologic
productivity in the mid-Pacific Ocean. During ACE-Asia campaign, we
acquired ground-based (temporal) and satellite (spatial) measuremer
infer aerosol physical/optical/radiative properties, column precipitable
amount, and surface reflectivity over this region. The inclusion of flux
measurements permits the determination of aerosol radiative flux in a
to measurements of loading and optical depth. At the time of the
Terra/MODIS, SeaWiFS, TOMS and other satellite overpasses, these g
based observations can provide valuable data to compare with satellit
retrievals over land. In this paper, we will demonstrate new capability
Deep Blue algorithm to track the evolution of the Asian dust storm fro
sources to sinks. Although there are large areas often covered by clou
the dust season in East Asia, this algorithm is able to distinguish heav
from clouds over the entire regions. Examination of the retrieved dail
of dust plumes over East Asia clearly identifies the sources contributir
the dust loading in the atmosphere. We have compared the satellite r
aerosol optical thickness to the ground-based measurements and obt
reasonable agreement between these two. Our results also indicate th
there is a large difference in the retrieved value of spectral single sca
albedo of windblown dust between different sources in East Asia.

Presentation Mode:

Keywords: Asian dust, ACE-Asia

Status: Reviewed.

Co-Authors