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Project Title: Investigations of radiative forcing of Indonesian biomass burning using
GMS radiance measurements

SECOND YEAR PROGRESS REPORT:

- 1) Further processed and analyzed GMS-5 radiances for the period from January 1998-June 2000.
- 2) Analyzed spatial and temporal distributions of the SeaWiFS-derived aerosol optical thickness for the year of 1998.
- 3) Compiled the solar radiation model for computing the solar fluxes at the top of the atmosphere and at the surface in an aerosol-laden atmosphere.
- 4) Processed and analyzed the SSMI-derived column water vapor amount for input to the solar radiation model.
- 5) Computed the direct radiative forcing, at the top of the atmosphere and the surface, of the SeaWiFS-derived aerosols over global oceans.
- 6) Compared the direct aerosol radiative forcing in the oceanic region surrounding the Maritime Continents between the October 1997 and October 1998. The former month was in an El Nino phase and the region of Maritime Continents was anomaly dry. There were big forest fires in Indonesia. The effect of the Indonesian forest fires on the radiation budget was found to be very large, especially at the surface.
- 7) Analyzed the global wind fields (stream function, convergence/divergence) of the NCEP reanalysis for the purpose of interpreting the spatial distribution of the SeaWiFS-inferred aerosols.
- 8) Studied the sensitivity of aerosol radiative forcing to the single-scattering albedo and asymmetry factor of various types of aerosols.
- 9) A paper entitled, "Aerosol radiative forcing over global oceans derived from SeaWiFS-inferred aerosol optical properties," is in preparation and will be submitted to the JAS special issue on aerosols.

THIRD YEAR STATEMENT OF WORK:

- 1) Further analysis of the global distribution of the direct radiative effect of the SeaWiFS-derived aerosols.
- 2) Investigation of the causes of the maximum aerosol loading in the Intertropical Convergence Zone (ITCZ), as derived by the SeaWiFS.
- 3) Analysis of the correlation of the atmospheric circulation with the spatial distribution of aerosols.
- 4) Comparison of the clear-sky albedo measured by the GMS-5 satellite with the direct radiative forcing of the SeaWiFS-derived aerosols in the tropical western Pacific.

- 5) Comparison of the SeaWiFS-derived aerosols and aerosol radiative forcing with the aerosols derived from the MODIS radiance measurements and the measurements during the INDOEX field experiment.
- 6) Estimation of the climate impact of the aerosol direct radiative forcing.