MODIS VALIDATION PLAN- Atmospheric group

1. Aerosol products

PRE-LAUNCH: The 3 SCAR (Smoke/Sulfates Cloud And Radiation) experiments: **ER-2 simulates MODIS**
AERONET-ground based validation
aircraft and ground-based in situ data

POST-LAUNCH:

AERONET-ground based validation
aircraft and ground-based in situ data
Lidars

CONSISTENCY CHECKS - in the level 3 product. Does the answer vary systematically as a function of parameter of which it should be independent.

2. Total precipitating water vapor

Same approach, but also radiosondes and microwave radiometers

3. Fire products

PRE-LAUNCH:
The SCAR-B, C data: Compare high resolution and low resolution analysis, compare fires and emitted smoke.

POST-LAUNCH: Similar experiments to SCAR-B and C are recommended, one for 1988 or 1999 and one for 2000.

4. Cloud Mask - Product MOD35 -

Quality assurance

* look for consistency (Monitor angle dependence of cloud cover there should not be any)

* Monitor consistency of global cloud cover from day to day should maintain 5% consistency

* Perform regional statistics
  look for persistence in certain regions (e.g. marine stratus)

* Correlate cloud mask with independent SST and OLR determinations should find good correlations

Validation

Collocation with higher resolution aircraft data, ground all sky cameras, and other AM platform instruments.

Comparison with ASTER cloud maps (also on AM platform), 60 km wide with 30m resolution

5. Cloud Top Properties and Cloud Phase - Product MOD06 -

Quality assurance

Cloud Top properties

radiosonde, stereo, and lidar estimates;
Additionally, cloud top pressures will be stratified as a function of satellite viewing angle to make sure that the atmospheric transmittance corrections for viewing angle are not introducing a bias.

Quality assurance :
MODIS cloud top pressures and effective emisivities will be compared to those determined from the NOAA HIRS and the GOES sounder.
MODIS Airborne Simulator and a lidar system on the ER2

Global mean distributions of cloud height and emissivity will be compared from one week to the next;

Cloud Phase

Quality assurance will consist of consistency checks with previous days

Validation

Cloud Top Properties

Comparisons with stereo determinations of cloud heights (using the two GOES satellites over the U. S., ground all sky cameras, and MISR and ATSR data as available), aircraft reports of cirrus cloud heights (from the ACARS), and lidar estimates of cirrus heights (using the University of Wisconsin lidar).

Cloud Phase

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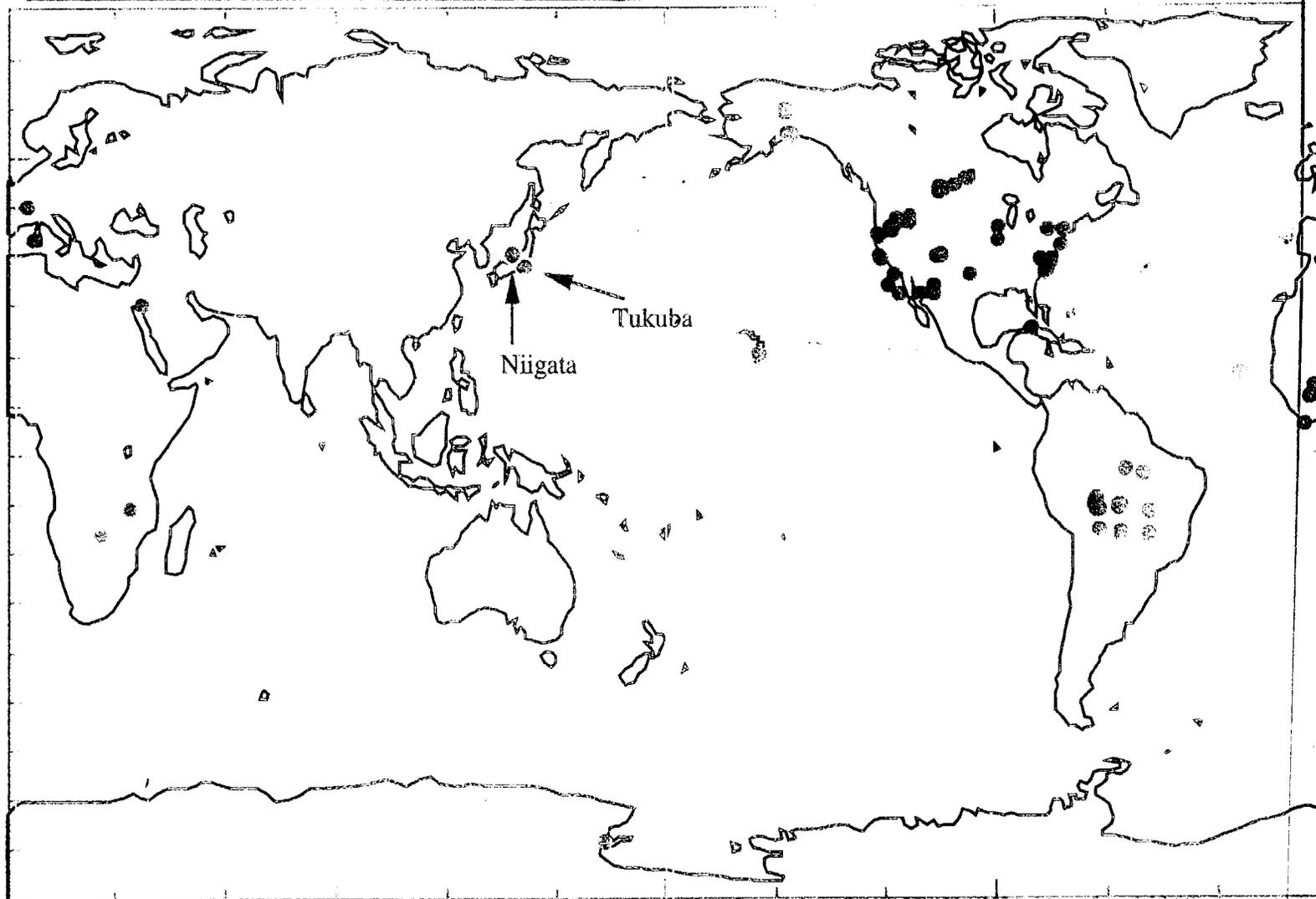
Cloud Phase

Validation will consist of close inspection of sections of data representing differing cloud regimes and surface types.

Field campaign with the MAS, HIS, and the ER-2 lidar, along with in comparisons of phase discrimination using the University of Wisconsin lidar.

Aerosol Volume distribution

τ_a 670 nm

Biomass Burning (Amazon, Cerrado)

urban/industrial
(Mid Atlantic US)

radius (μm)
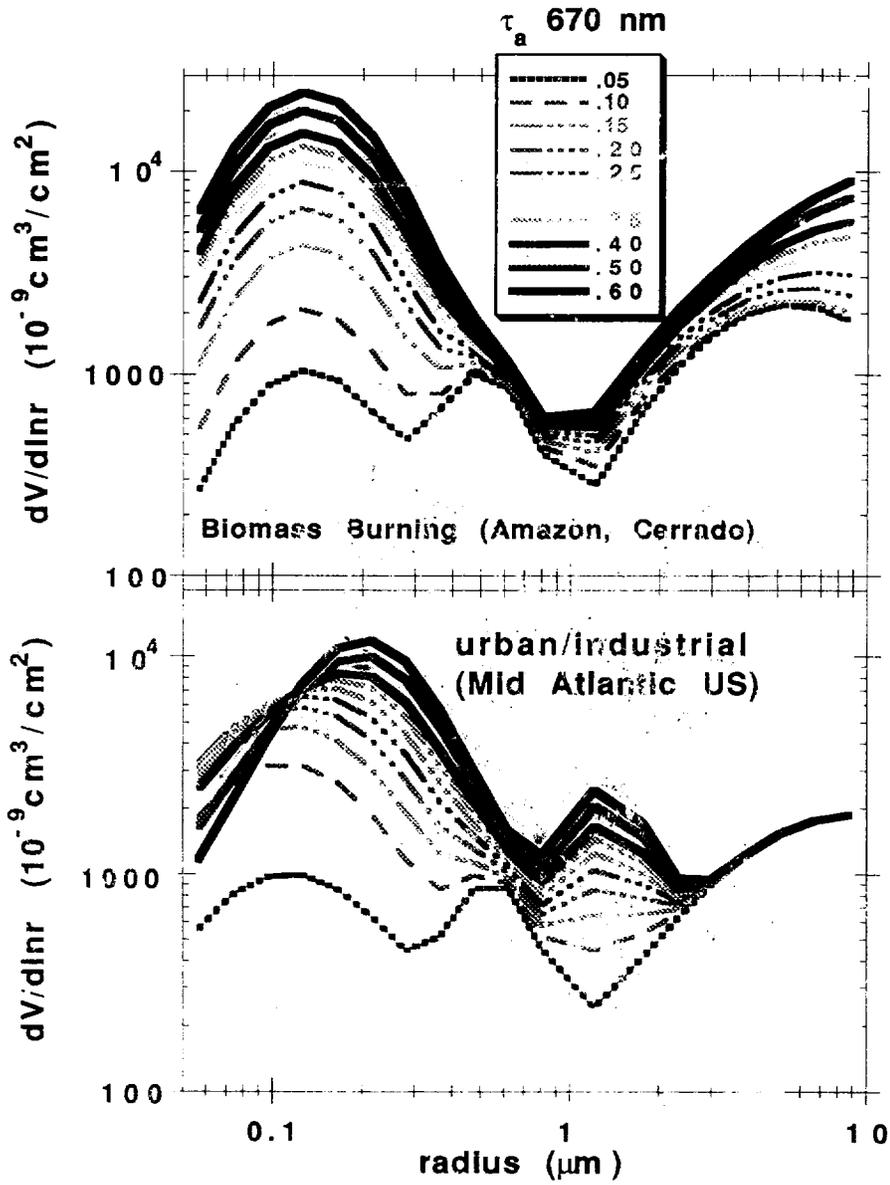
Aureole meter Global Map '95

Tukuba

Niigata