Meteorological Service of Canada
Environment Canada

First AEROCOM Worksop
June 2-3, Paris

Simulations of Size-segregated Aerosols in the Atmosphere
with GCM/CAM

Sunling Gong

Model Structure

- **Canadian GCM**
- **Canadian Aerosol Module (CAM)**
  - **Sea-salt**
  - **Sulphate**
  - **Soil Dust**
  - **Black Carbon**
  - **Organic Carbon**

Configurations

Aerosols	12 bin sectional model: r=0.005 – 20.48 μm [dry]
Sources	**Sulphate:** anthropogenic SO_2 and SO_4 (GEIA 1B: 2-level) oceanic DMS concentration (Kettle *et al.*) land H_2S (Benkovitz *et al.*) **Sea-salt:** size-segregated, Gong **BC/OC:** fossil fuel (Cook *et al.*) bio-mass (Liousse and Penner *et al*) boreal (Lavoue *et al*) **Soil Dust:** size-segregated, Marticorena and Bergametti
Prognostic Variables	Aerosol mass mixing ratio in each size bin, cloud water and ice, DMS, SO_2, H_2S and H_2SO_4[g]
Clear-sky processes	Nucleation, condensation, coagulation, on-line S chemistry with MOZART's OH and NO_3
Wet Processes	Gong *et al* : Below- and In-cloud scavenging Lohmann : Explicit cloud scheme Cloud activation and cloud S chemistry with MOZART's O_3, H_2O_2 and HNO_3, and NH_3
Dry Deposition	Size-dependent particle and SO_2
Resolution	128×64×32, 15 min

AEROCOM Run Status

√ **Monthly**
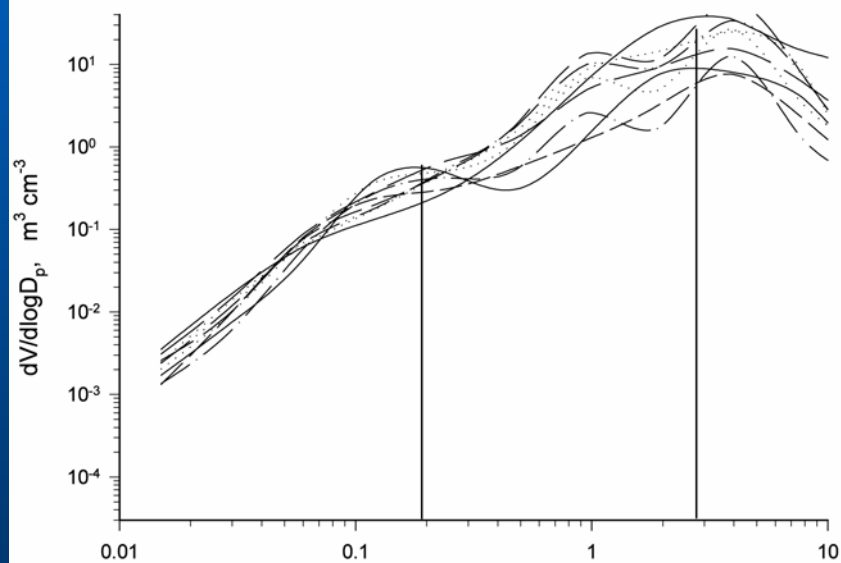
√ **Daily**

Summary

- **Unique features**
  - **Size-segregated**
  - **Interactions**
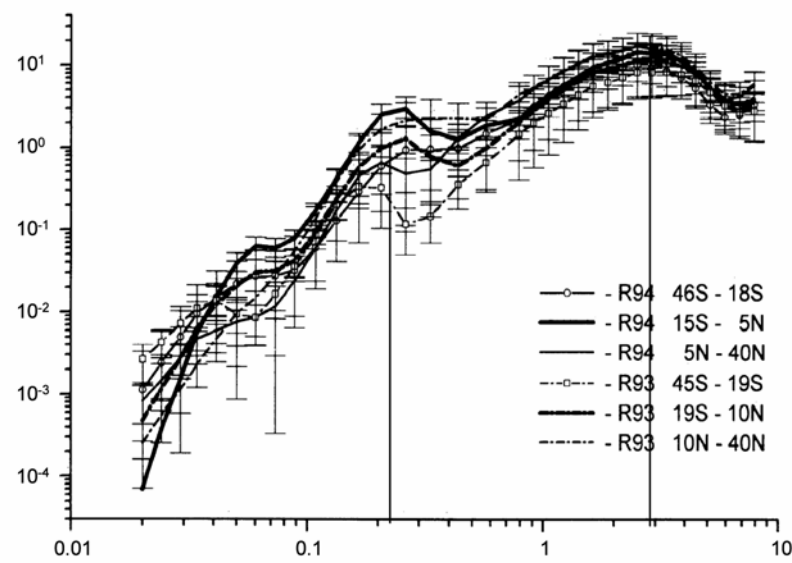- **Future**
  - **Radiative forcing**
  - **Impact on clouds**

CAM in GCM – Global Sea-salt/Sulphate