THE EFFECTS OF ANTHROPOGENIC AEROSOLS FROM CHILE AND MEXICO IN ECHAM-HAMMOZ

Tuuli Miinalainen1// Harri Kokkola2 // Kari E.J. Lehtinen1,2 // Thomas Kühn1,2

1 Department of Applied Physics, University of Eastern Finland, Kuopio, Finland //
2 Atmospheric Research Centre of Eastern Finland, Finnish Meteorological Institute, Kuopio, Finland

GLOBAL CLIMATE MODELING
Aerosol-climate model ECHAM-HAMMOZ (ECHAM6.3-HAM2.3) with the sectional aerosol micro-physics module SALSA2.0

WHAT: Studying the effects on local climate of anthropogenic black carbon (BC), organic carbon (OC) and sulfur dioxide (SO2) originating from Chile and Mexico.

WHY: The interdisciplinary research project ClimaSlow (climate law + modeling): Chile & Mexico have ambitious climate strategies and interesting local climate

HOW: Using an aerosol-chemistry-climate model to simulate climatic effects of atmospheric aerosols

MAIN FINDINGS: Each country has different potential to affect radiation and climate

MODELING SET UP

- BASE scenario with all aerosol emissions included (year 2015),
- 10 years simulated
- 3 individual cases without the aerosols from Chile and Mexico (NO_SO2, NO_BC and NO_OC)
- Meteorology nudged, fixed SST/SIC

Figures 2 & 3: The direct aerosol forcing, indirect & semi-direct forcing, and effective radiative forcing (ERFNDG) for ChileROI and MexicoROI

Figure 1. Regions of interest (ROIs) for data-analysis defined based on the relative differences in N100 and CDNC burdens

tuuli.miinalainen@uef.fi