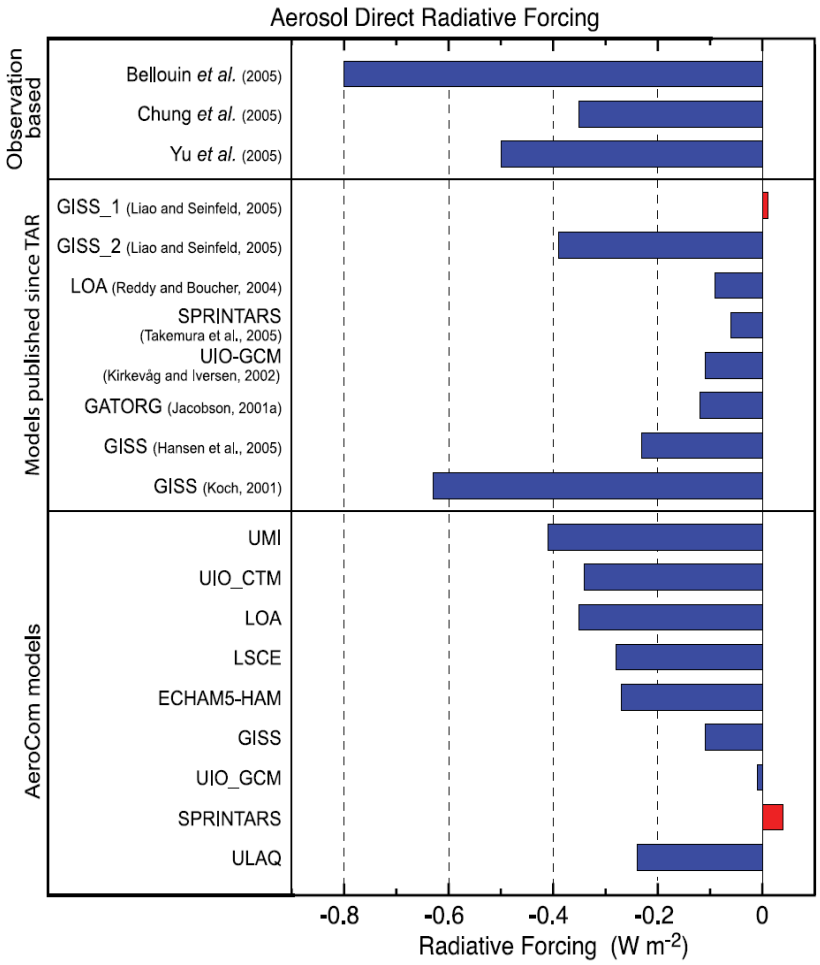
# Direct aerosol effect AeroCom Phase II

No final results so far

Some plans for validation and some progress

# Estimates of the direct aerosol effect
# IPCC AR4

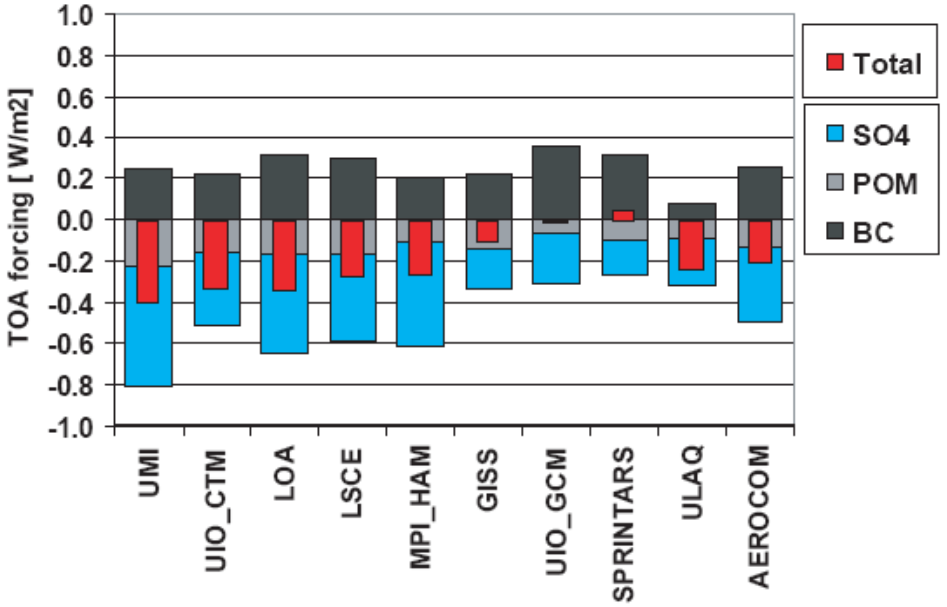



- In addition two new observational studies:
- Bellouin et al., JGR, 2008, RF -0.65 $Wm^{-2}$
- Quaas et al., JGR, 2008, RF -0.9 $Wm^{-2}$

Atmos. Chem. Phys., 6, 5225–5246, 2006

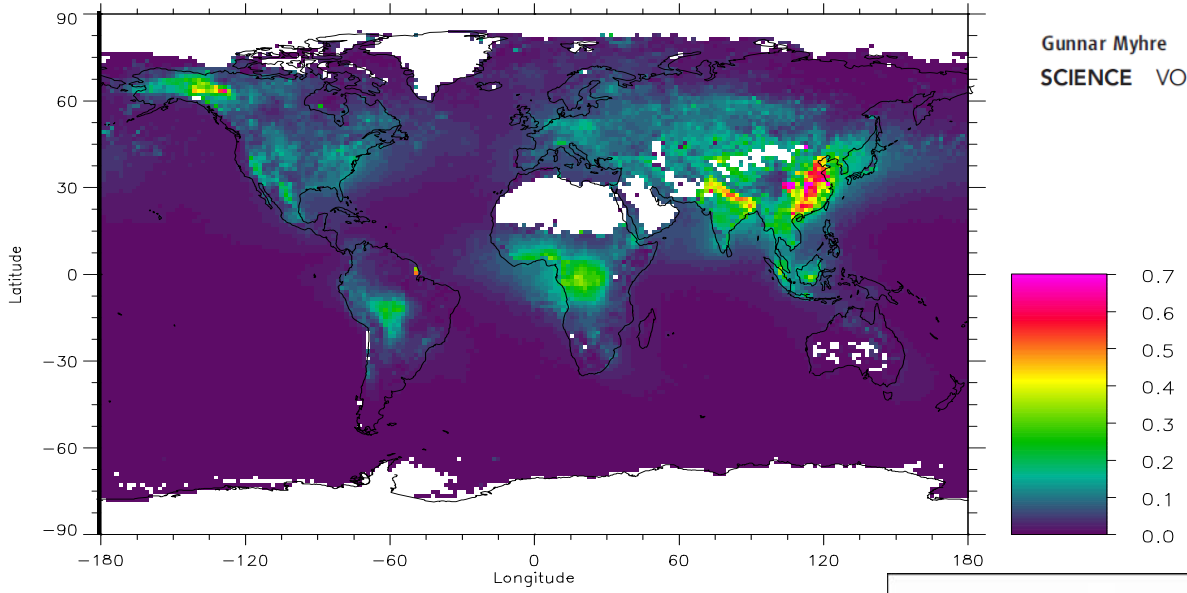
**Radiative forcing by aerosols as derived from the AeroCom present-day and pre-industrial simulations**

M. Schulz[1], C. Textor[1], S. Kinne[2], Y. Balkanski[1], S. Bauer[3], T. Berntsen[4], T. Berglen[4], O. Boucher[5,11], F. Dentener[6], S. Guibert[1], I. S. A. Isaksen[4], T. Iversen[4], D. Koch[3], A. Kirkevåg[4], X. Liu[7,12], V. Montanaro[8], G. Myhre[4], J. E. Penner[7], G. Pitari[8], S. Reddy[9], Ø. Seland[4], P. Stier[2], and T. Takemura[10]




- Nine global aerosols models with identical anthropogenic and natural aerosol emissions
- Simulations for present and pre-industrial aerosol conditions

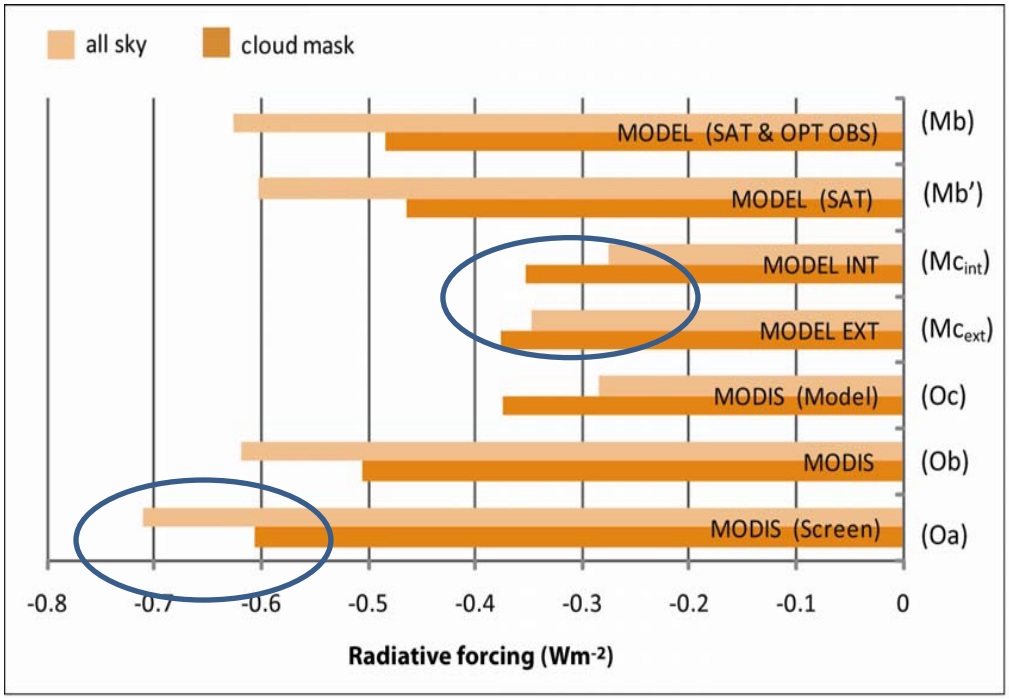
Anthropogenic AOD, Observational-based method



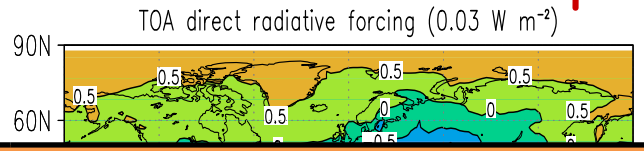

# Consistency Between Satellite-Derived and Modeled Estimates of the Direct Aerosol Effect

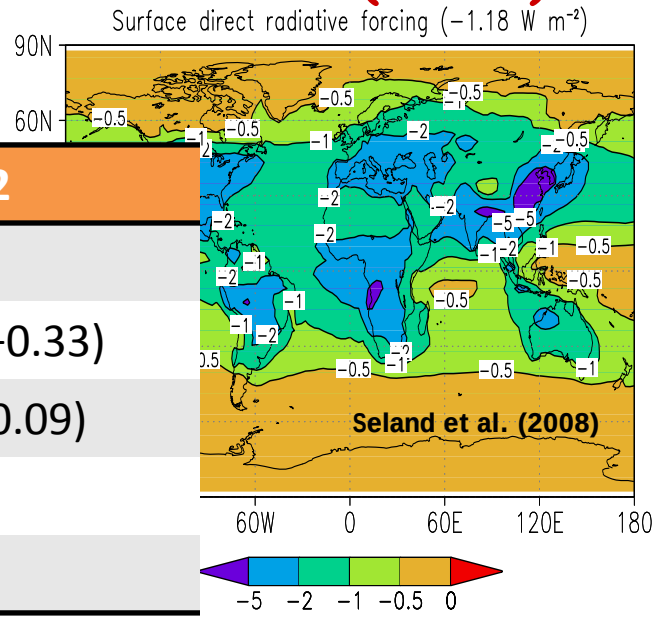
Gunnar Myhre

SCIENCE VOL 325 10 JULY 2009 187



# CAM-Oslo direct radiative forcing,DRF, Year 2000 vs. "pre-industrial" (1750)




| | CAM-Oslo | Oslo-CTM2 |
|---|---|---|
| Sulphate | -0.34 | -0.44 |
| BC | +0.50 | +0.73 (FF +0.33) |
| OC | -0.17 | -0.41 (FF -0.09) |
| Total (Sul+BC+OC) | +0.03 | -0.12 |
| Total | | -0.28 |

| Model | Anthropogenic AOD | Anthropogenic Abs AOD | Anthropogenic SSA | TOA RF ($Wm^{-2}$) | Surface RF ($Wm^{-2}$) |
|---|---|---|---|---|---|
| CAM-Oslo | 0.0342 | 0.00249 | 0.927 | +0.03 | -1.19 |
| Oslo CTM2 | 0.045 | ~0.0033 | ~0.927 | -0.28 | -1.99 |

# Quantify the model differences

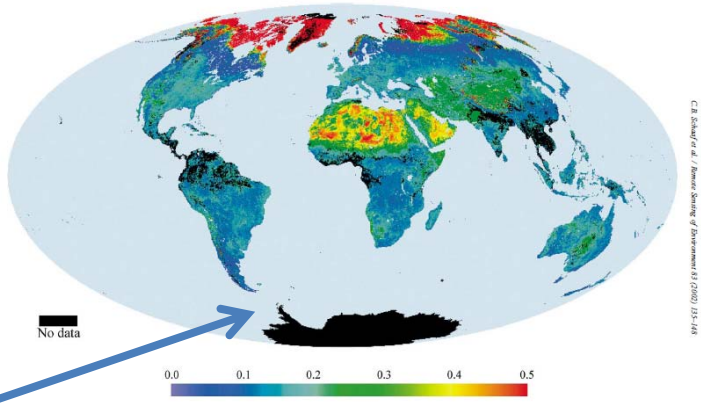
Aerosol
- Vertical profile
- Spatial distribution
- Optical properties

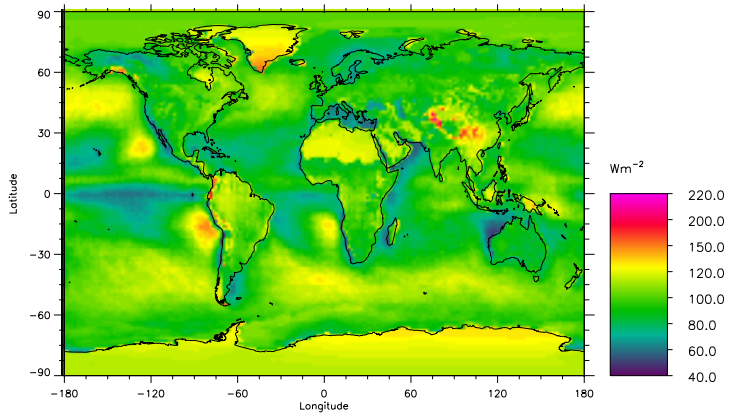
Surface albedo

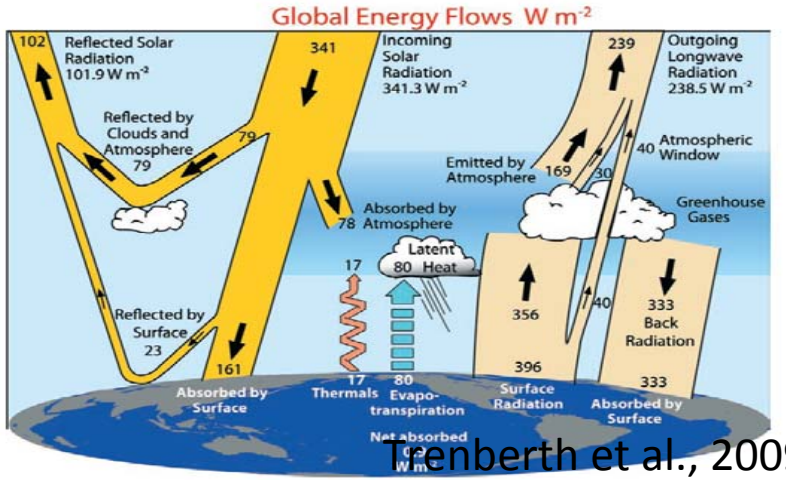
TOA albedo

Atmospheric absorption (gases and aerosols)

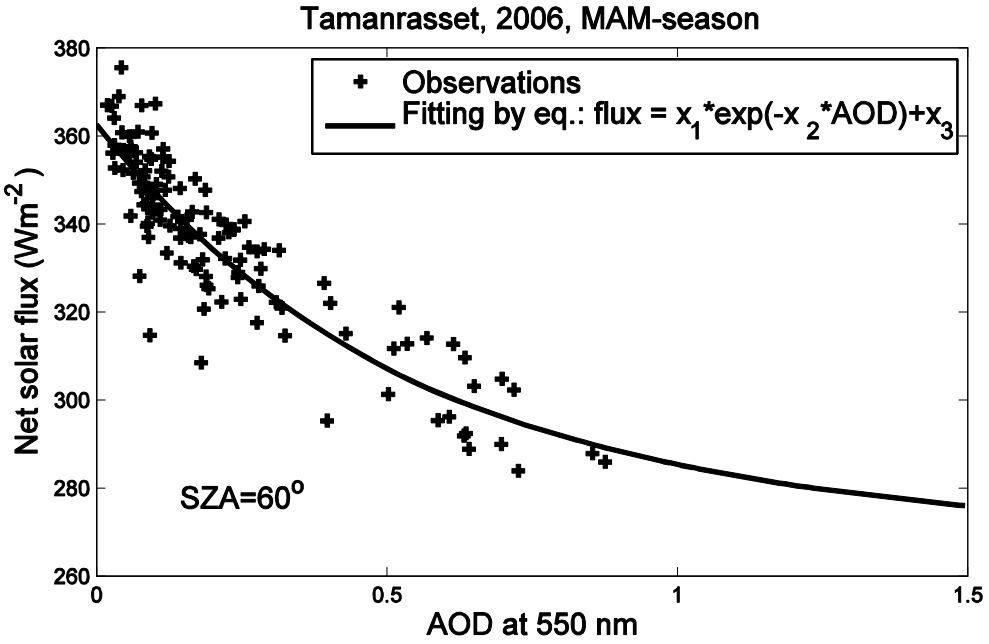
Cloud radiative forcing

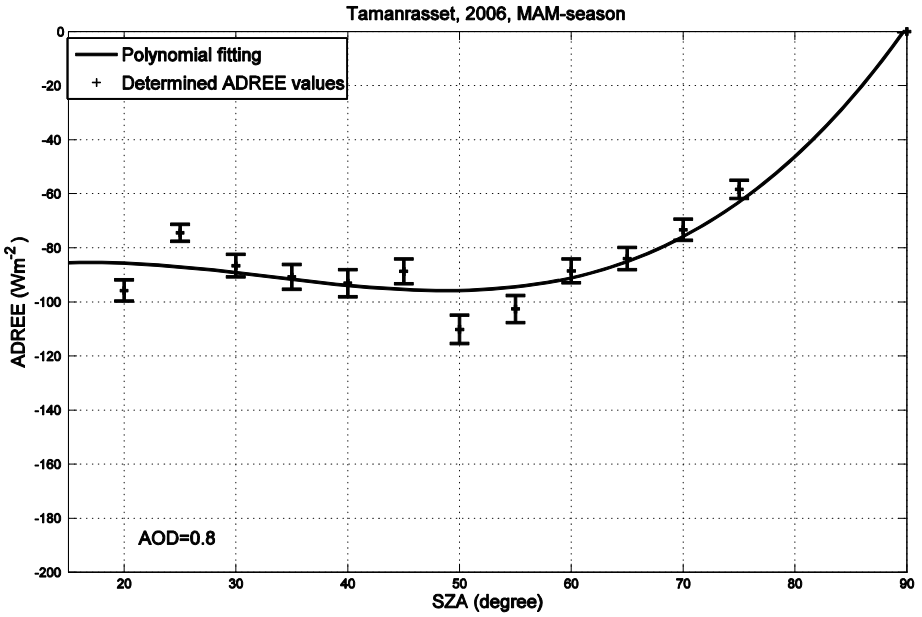



Trenberth et al., 2009

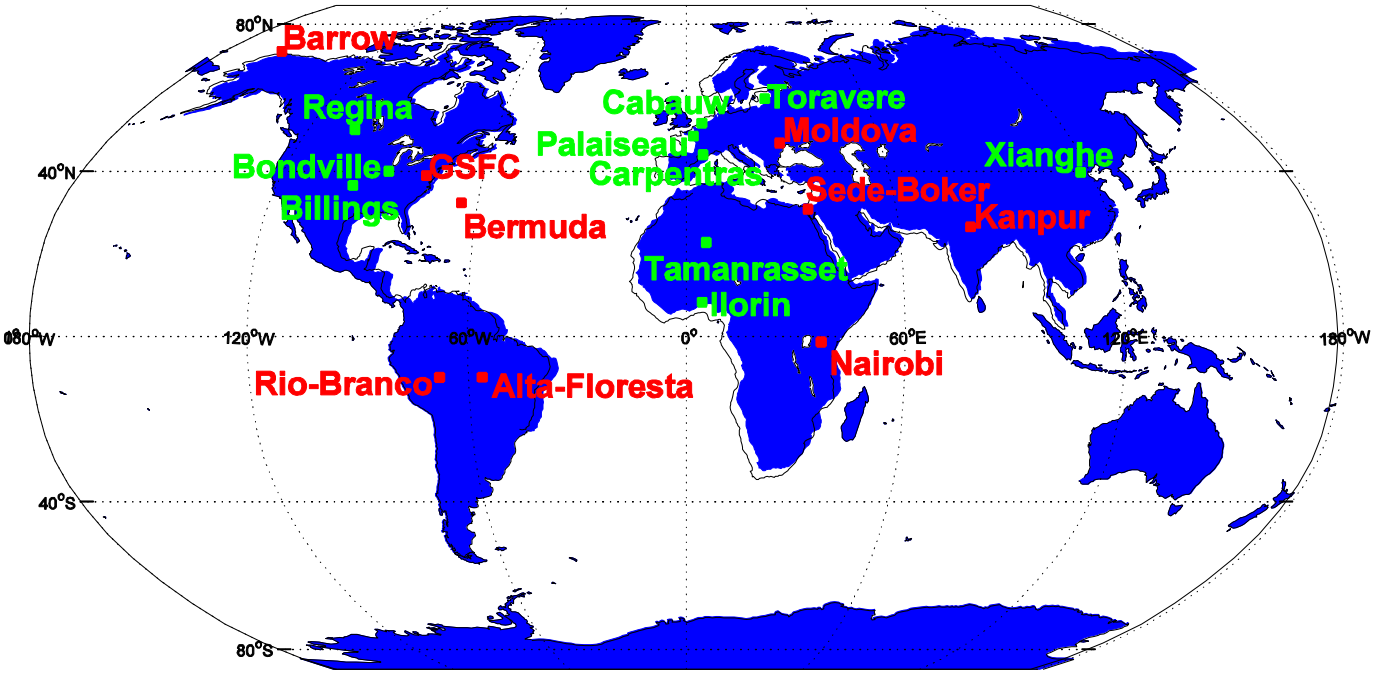



**Poster:**
**Huttunen et al.**

**Red sites:**
**SolRadNet**

**Green sites:**
**BSRN**



# Poster:
# Huttunen et al.

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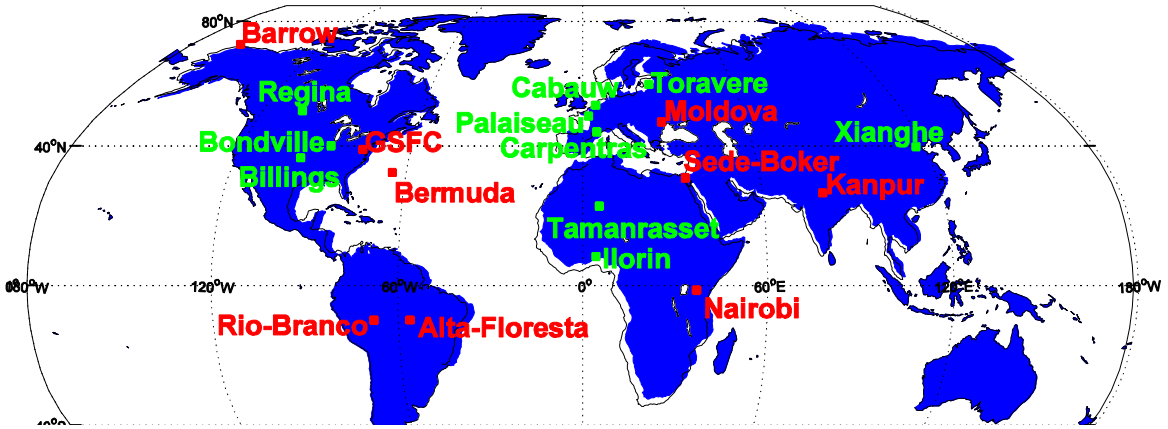


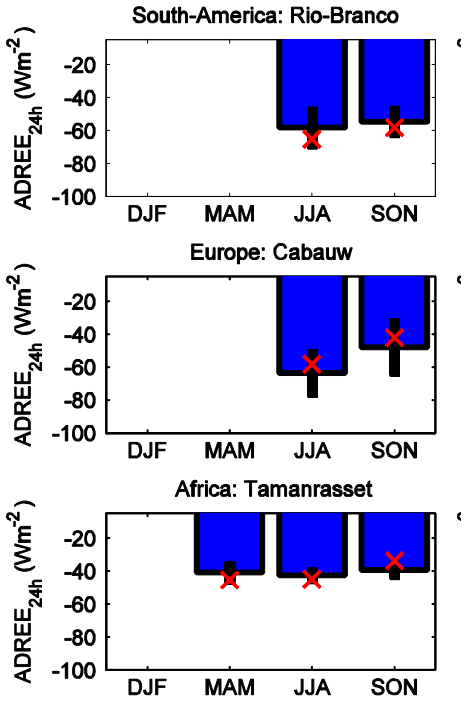


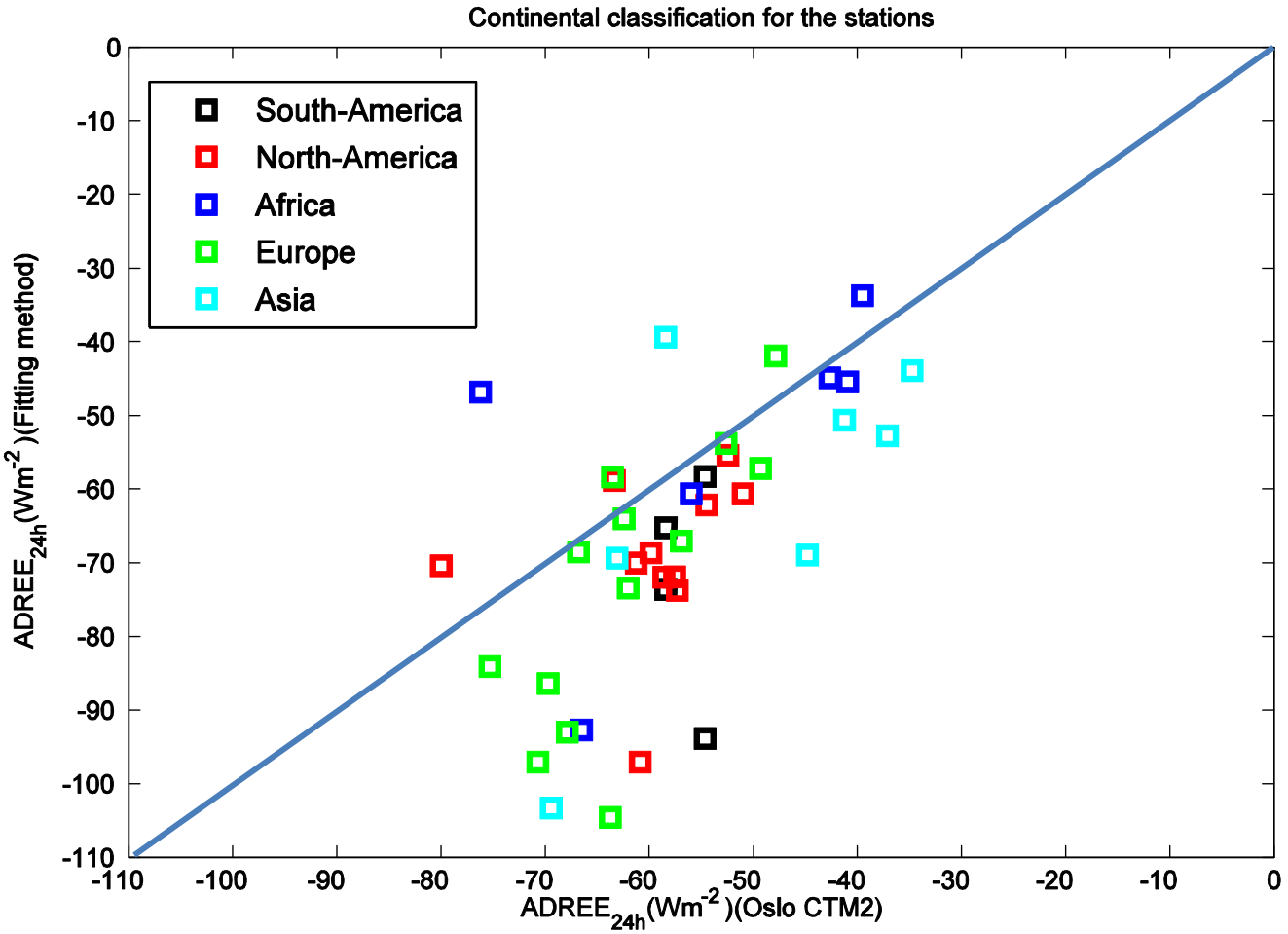

# Participating groups so far

| | |
|---|---|
| **DIRECT FORCING** | **HADGEM / INCA / SPRINTARS / GISSX / GISSM / NorAGCM / GOCART / Oslo CTM2** |

**We would certainly like more modelling groups involved!!**