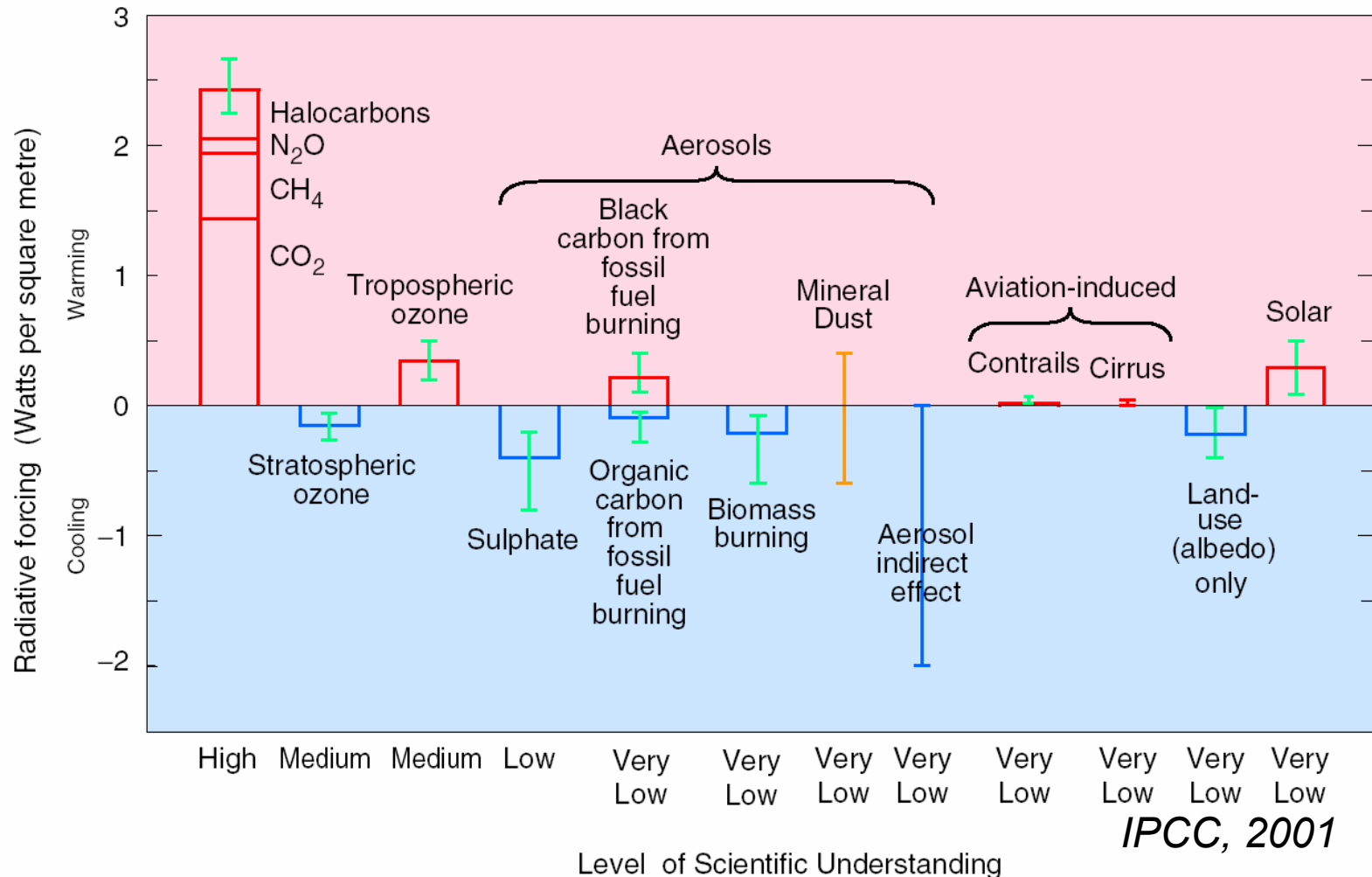


Dust Radiative Forcing

The global mean radiative forcing of the climate system for the year 2000, relative to 1750



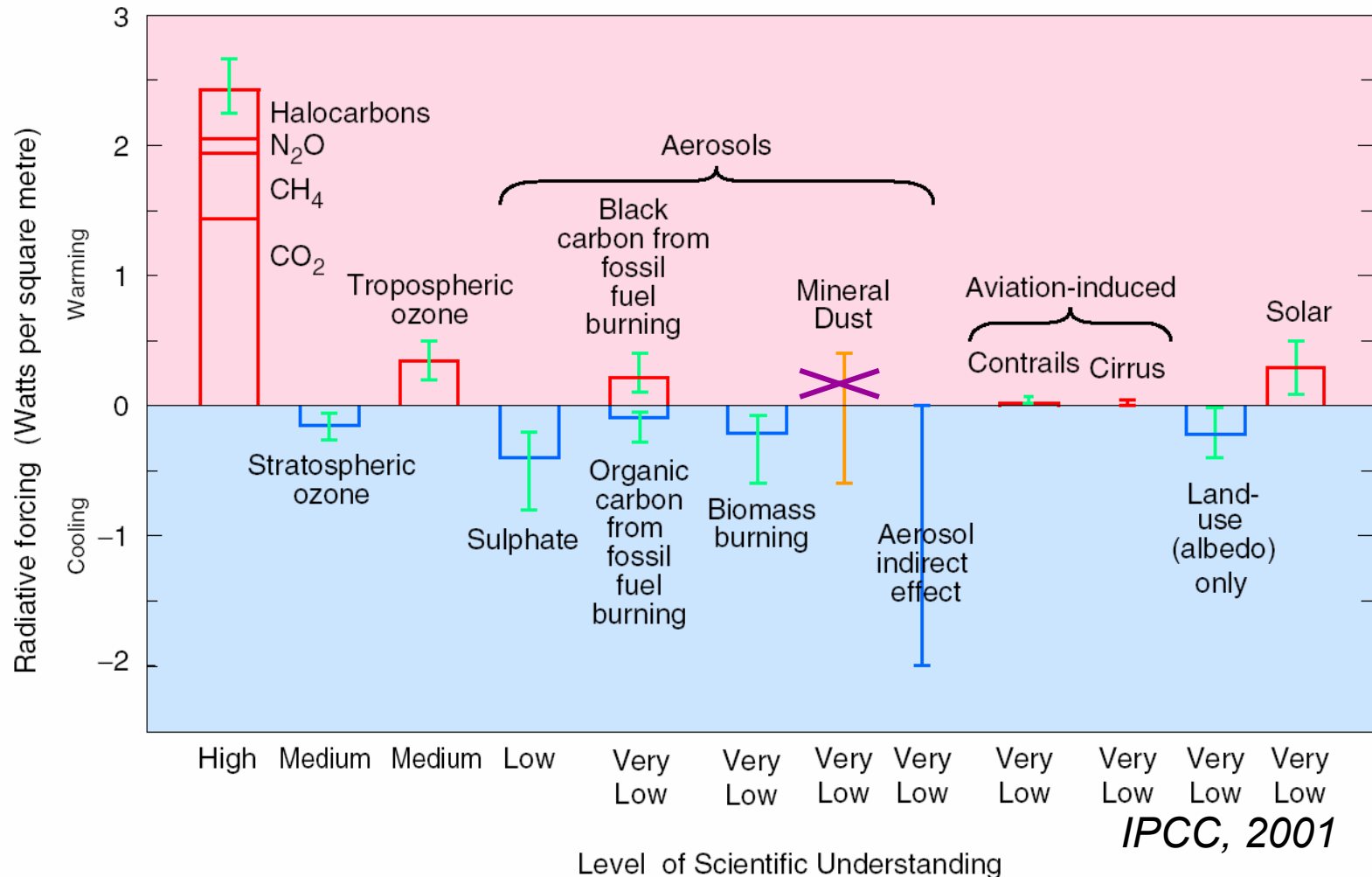
„Anthropogenic dust“

(see also Zender et al., EOS, this week)

1. Soil surface disruption by humans (<<50%?)
2. Change of dust source regions by changing climate patterns due to global warming (-60%-+20%?)

Dust Radiative Forcing

The global mean radiative forcing of the climate system for the year 2000, relative to 1750



Dust absorption in global models: SSA computed as function of particle size and imaginary part of refractive index

1. Laboratory measurements (e.g. WMO, 1983)
+sensitivity studies

(Patterson et al., 1977: $n(\text{im})(500\text{nm})$ Barbados: 0.008/0.0025
Sal Island: 0.008/0.005 – dust only /mixed with sea salt

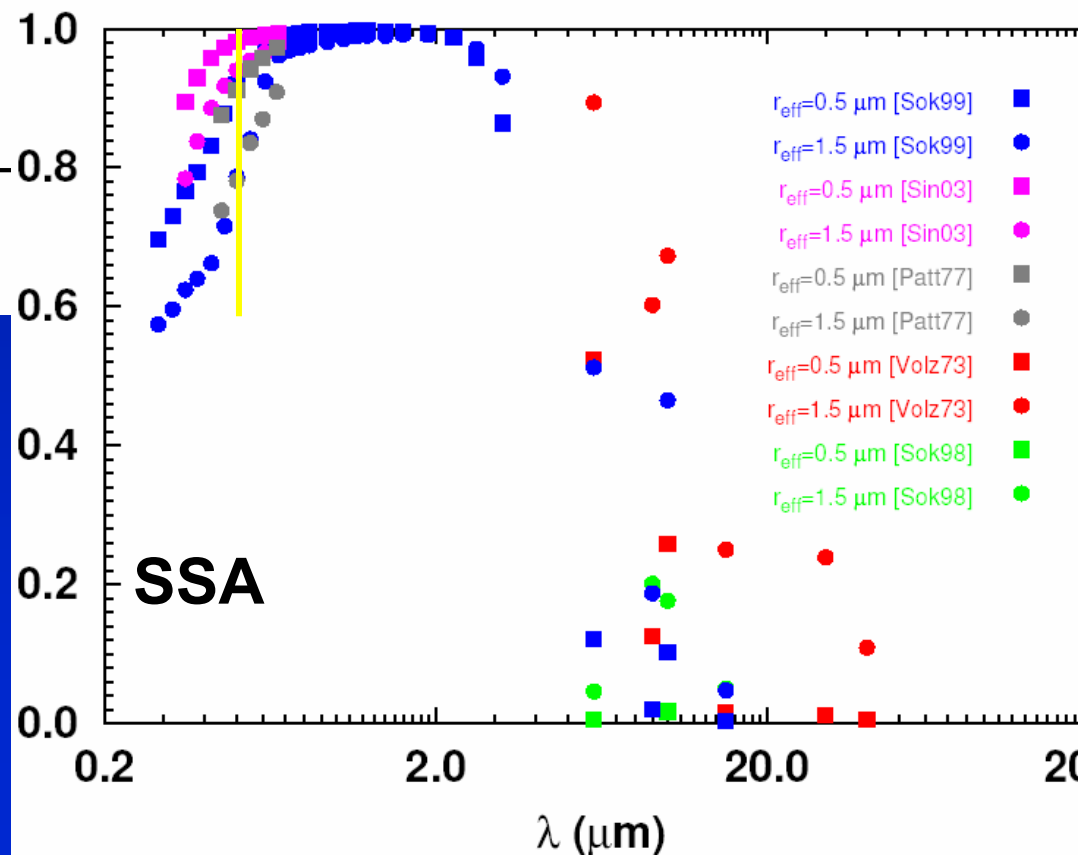
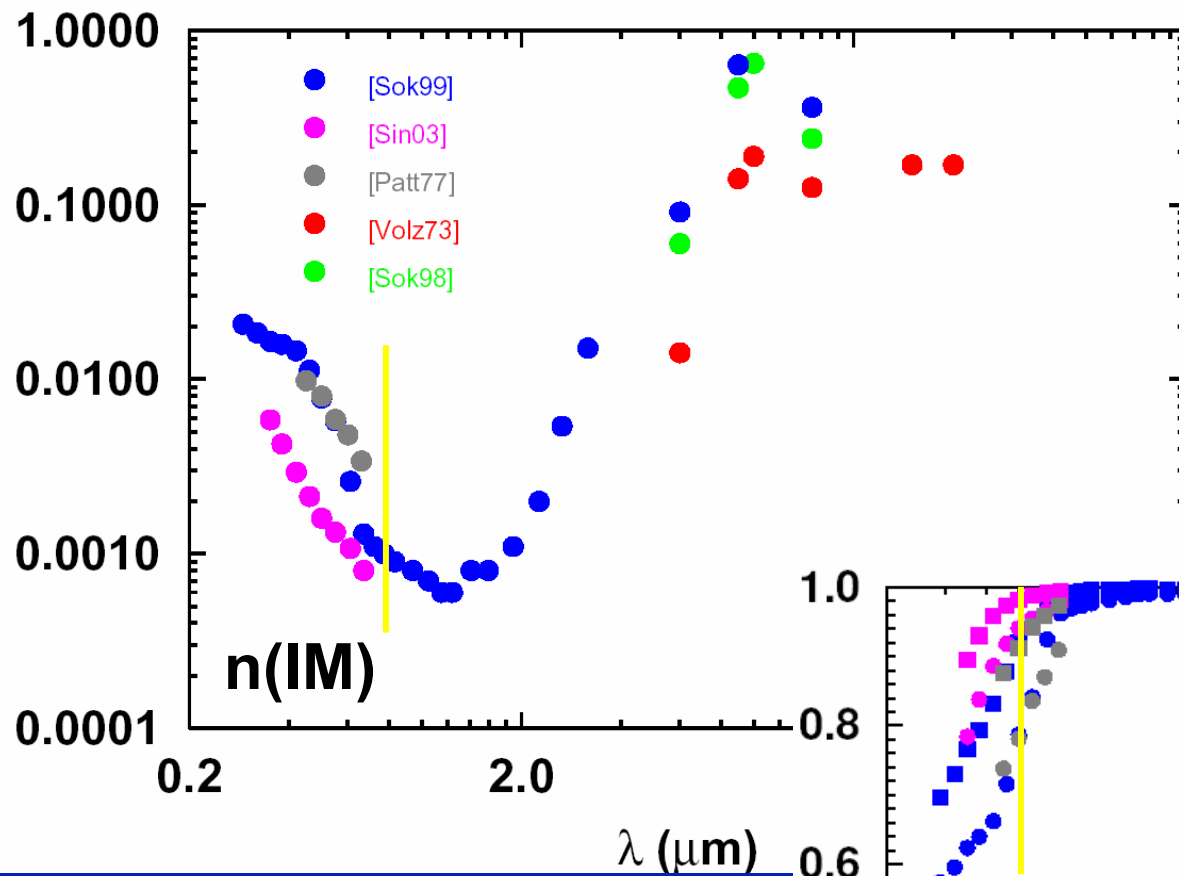
2. Mixture of minerals (quartz/hematite (1-2%))

Would be preferable for modeling – currently composition insufficiently known on global scale

3. Remote sensing of Saharan dust/AERONET

Column information, not all regions

$$\omega_0(500\text{nm}): 0.86 \rightarrow 0.97$$



- Saharan dust ca. 50% of dust emissions – other dust (Asia, Australia)?
- Modification during transport?
- Sensitivity studies still needed for studies of radiative impact of desert dust