Supersaturation in ECHAM

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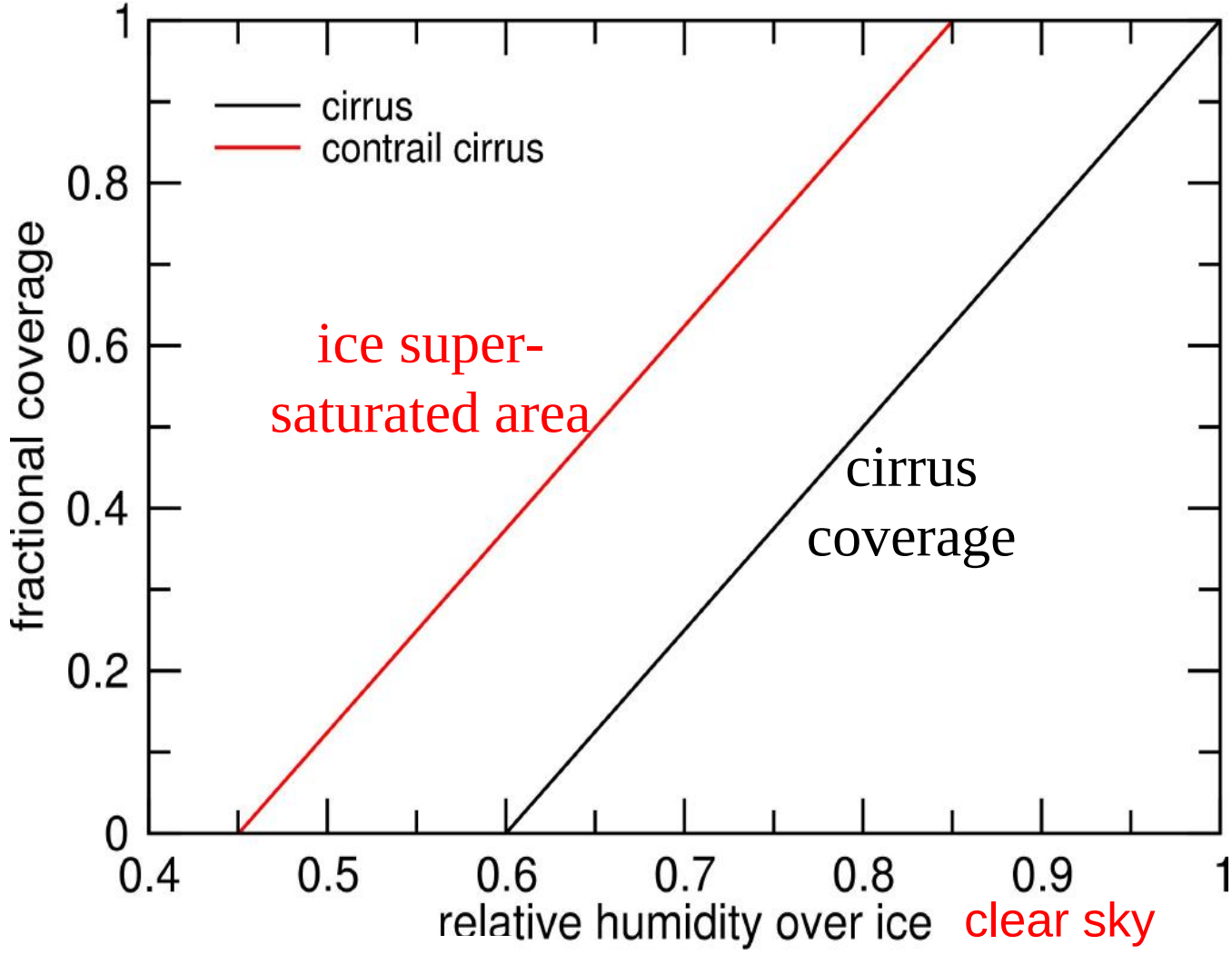
Parameterization of ice supersaturation consistent with Sundqvist cloud scheme

subgrid scale variability leads to a fractional cirrus coverage at low relative humidity

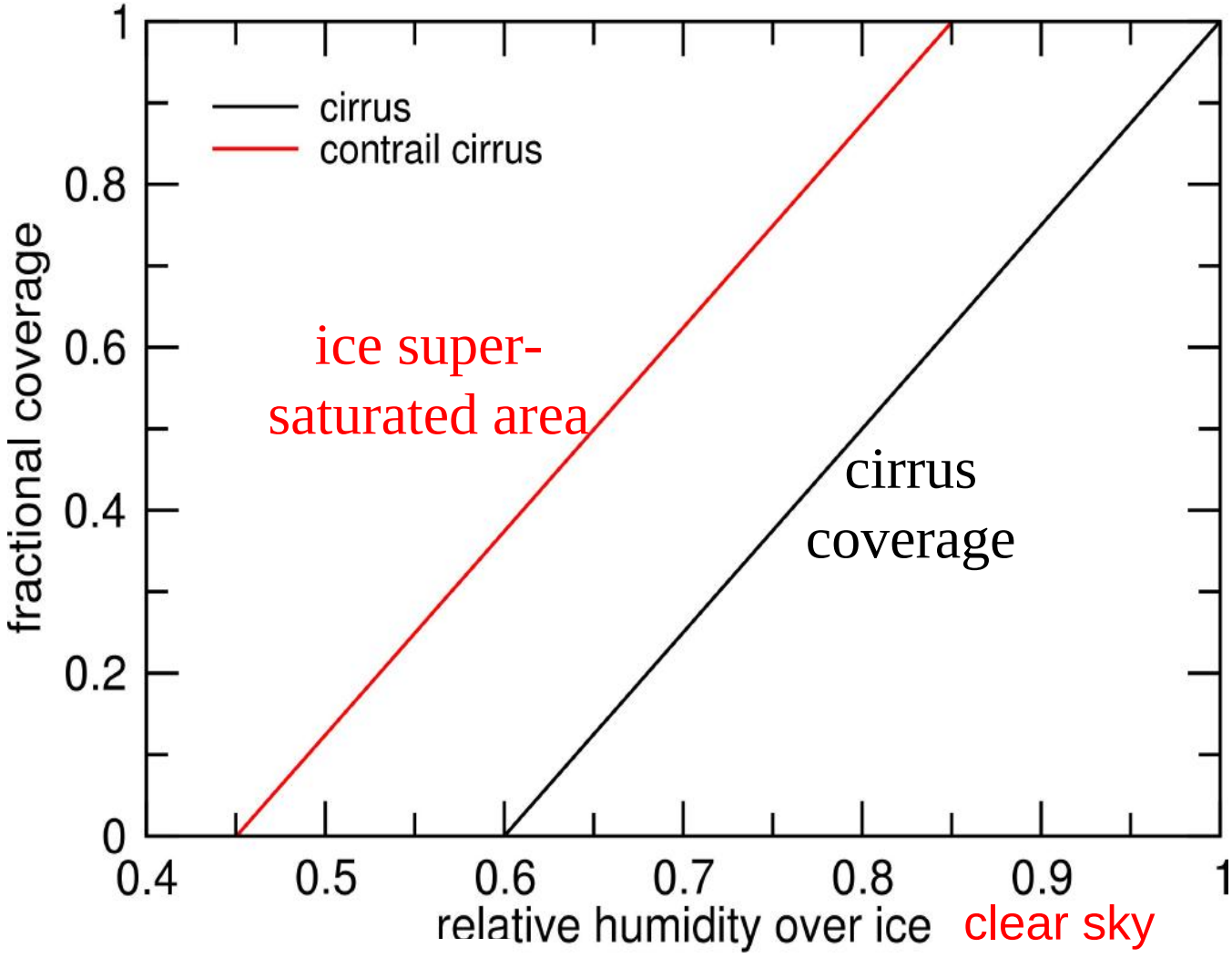


Burkhardt et al, GRL, 2008.

Parameterization of ice supersaturation consistent with Sundqvist cloud scheme

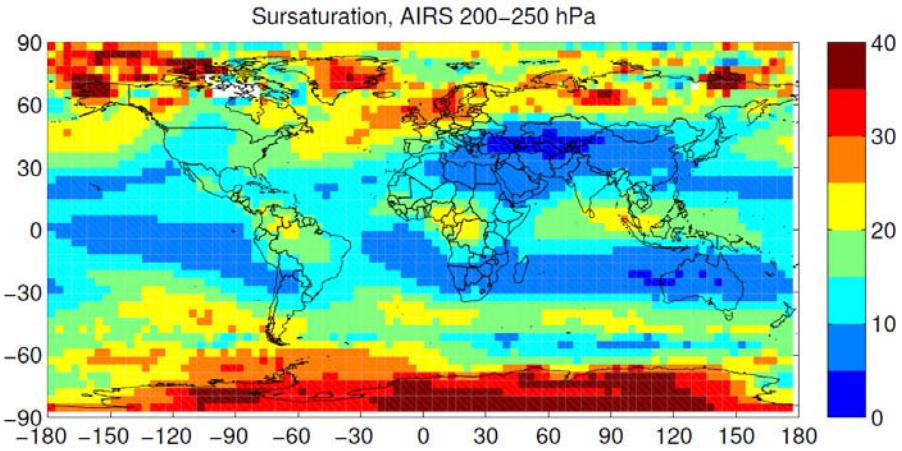
subgrid scale variability leads to a fractional cirrus coverage at low relative humidity

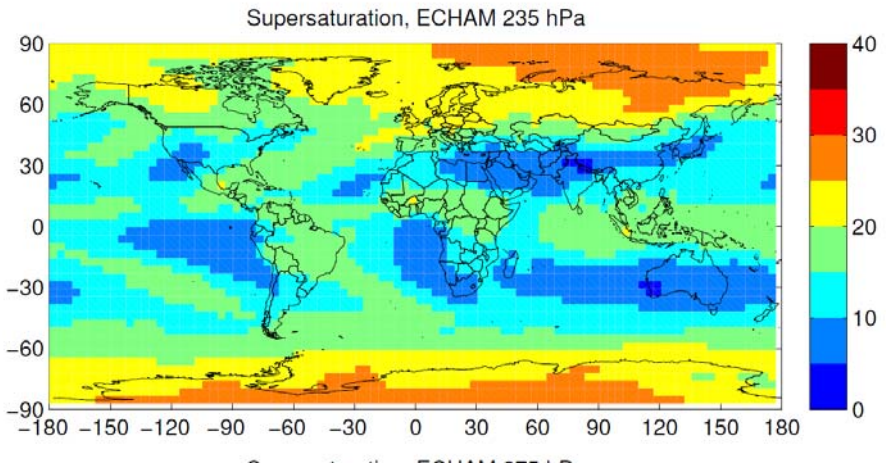
difference between threshold for cirrus coverage and ice supersaturation defined using Koop line



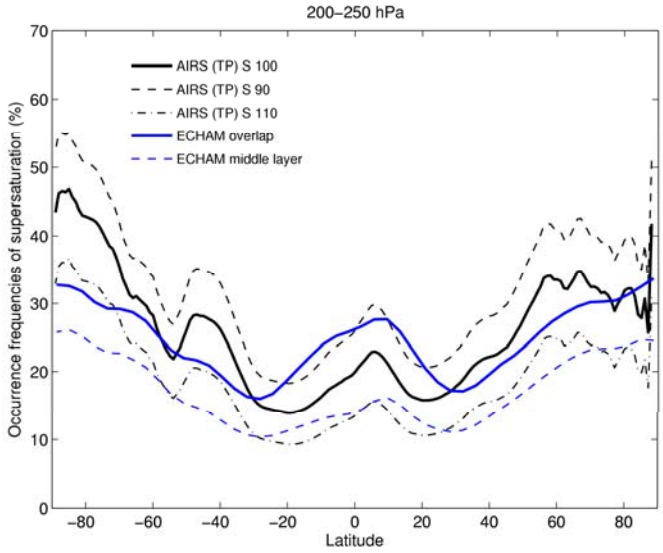
Burkhardt et al, GRL, 2008.

Parameterization of ice supersaturation
Comparison to AIRS estimates



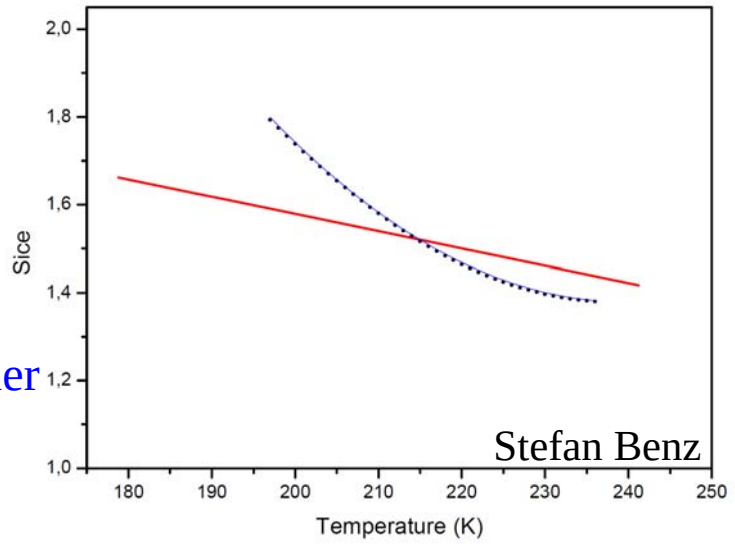


Nicolas Lamquin



Parameterized supersaturation compares well with AIRS (troposphere only) estimates at the upper levels

Dependency of supersaturation frequency on ice nucleation threshold

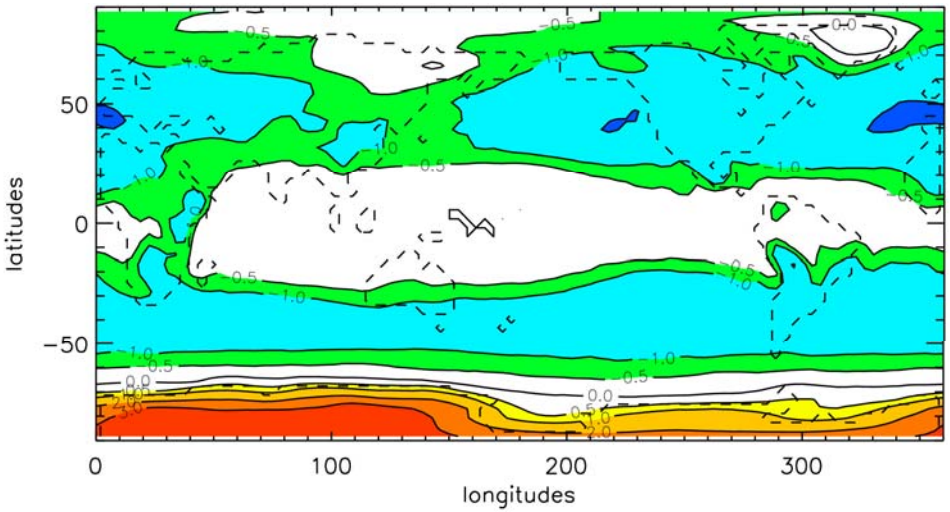


---Stefan Benz, Ottmar Möhler

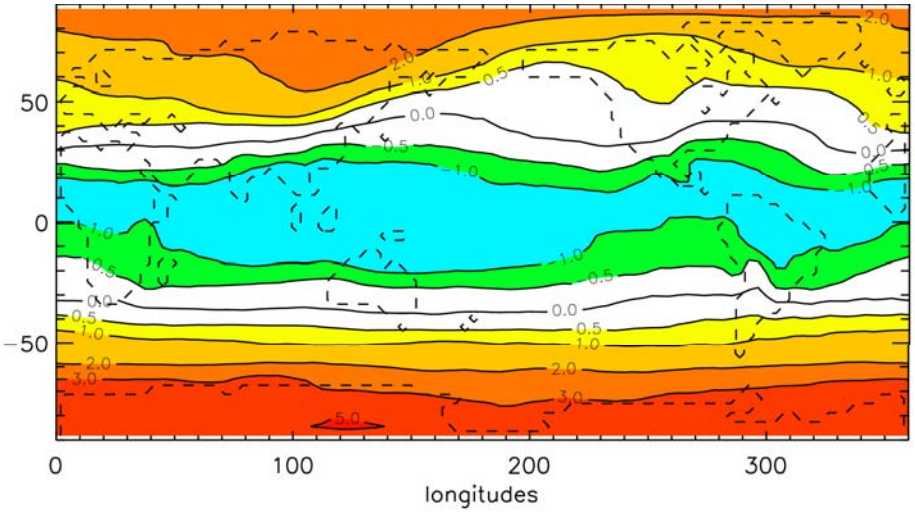
---Koop

New AIDA measurements hint at aerosol dependent changes in homogeneous freezing thresholds

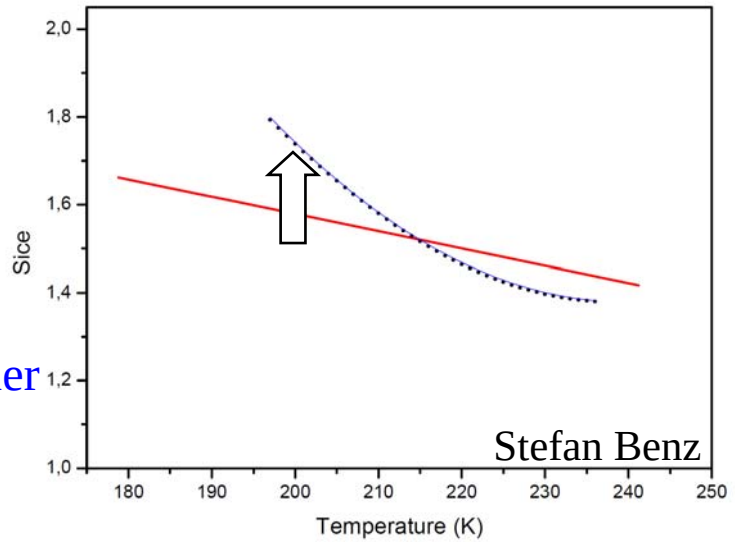
300 hPa



200 hPa



Dependency of supersaturation frequency on ice nucleation threshold



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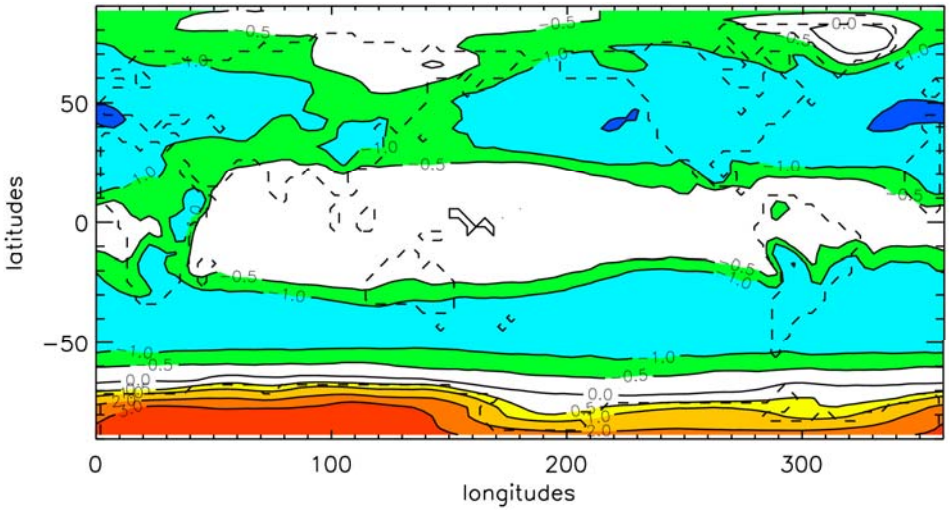
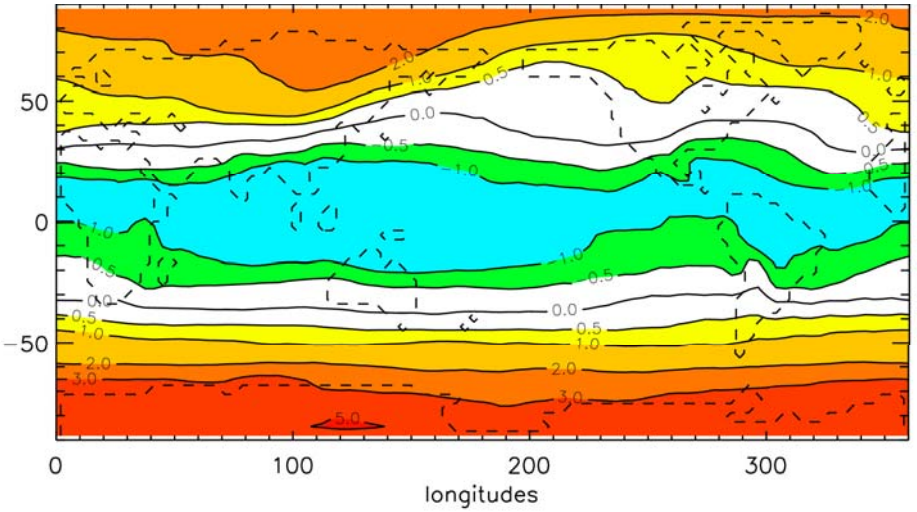
300 hPa

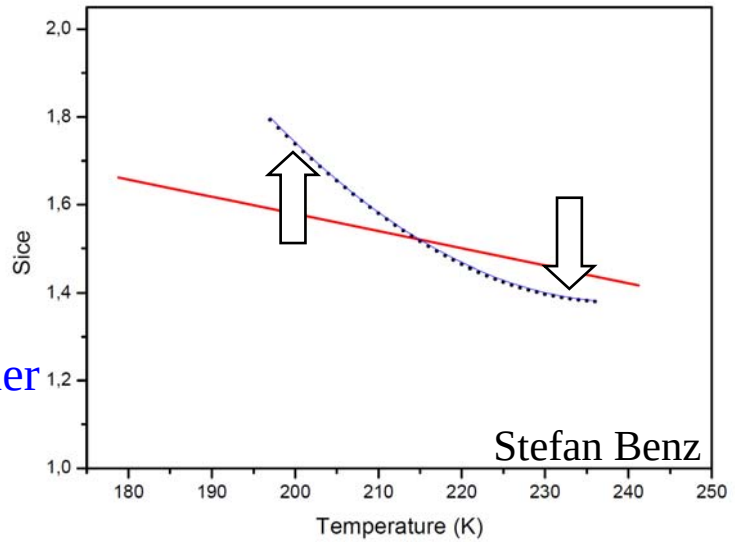


200 hPa



low temperatures - increase in supersaturation frequency

Dependency of supersaturation frequency on ice nucleation threshold



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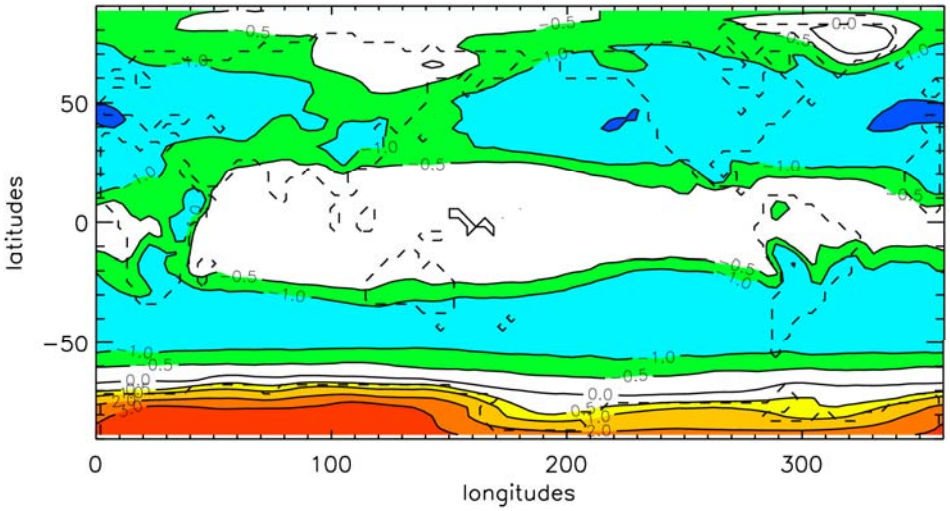
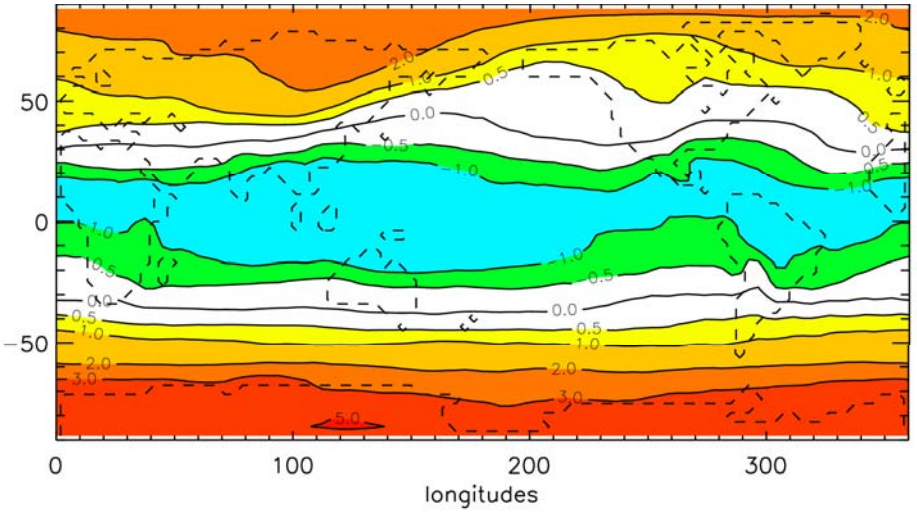
300 hPa



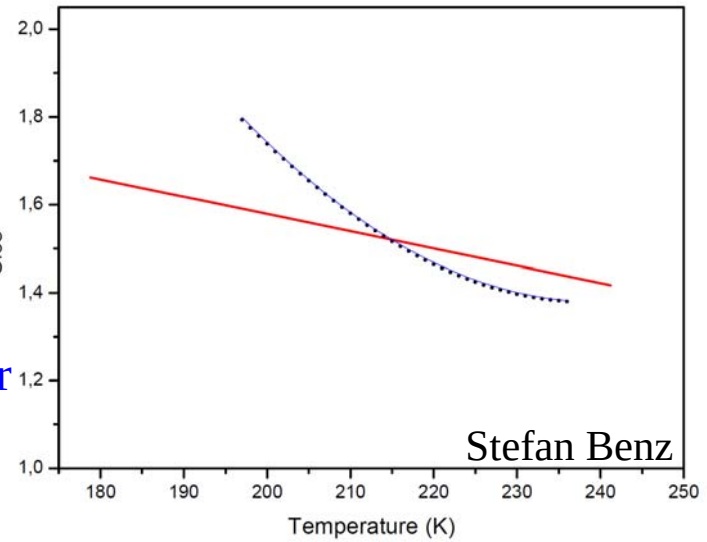
200 hPa



low temperature - increase in supersaturation frequency

high temperatures - decrease in supersaturation frequency

Dependency of supersaturation frequency on ice nucleation threshold



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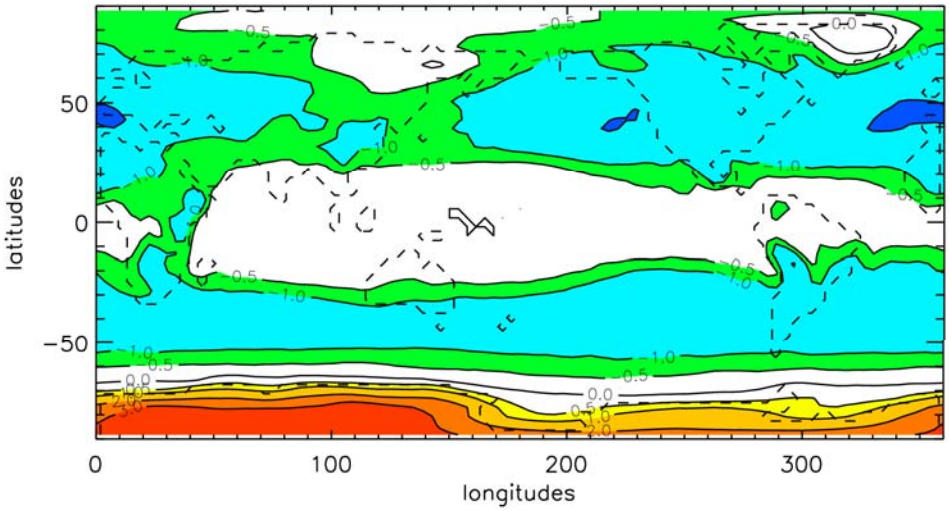
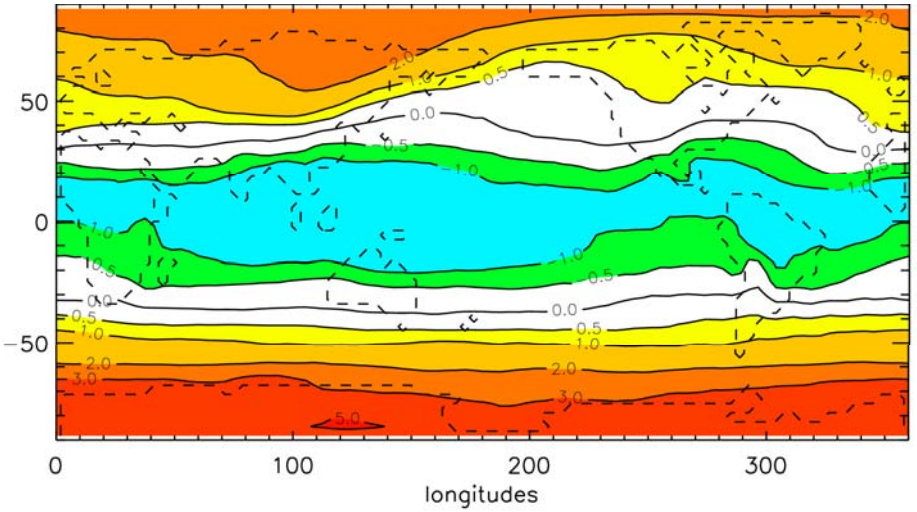
300 hPa



200 hPa



Change in supersaturation frequency due to different threshold of up to 10% of original value