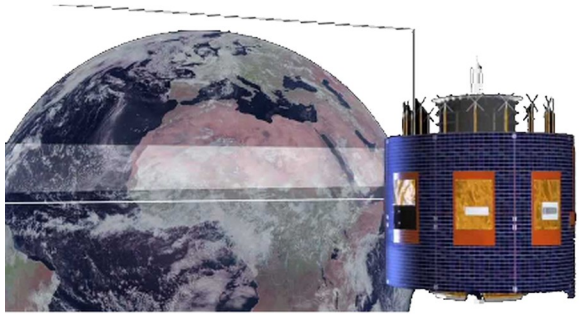
Increasing resolution and resolving convection improves the simulation of cloud-radiative effects over the North Atlantic

Senf, Fabian; Voigt, Aiko; Clerbaux, Nicolas; Deneke, Hartwig; Hünerbein, Anja



- **ICON-NWP Simulations**
  - 4 sets, each 3-4 days forecasts
  - with varying grid spacing: 2.5, 5, 10, 20, 40 & 80 km
  - with one- & two-moment microphysics
  - with or without convection parameterization

Senf et al. (2020), JGR, doi:10.1029/2020JD032667

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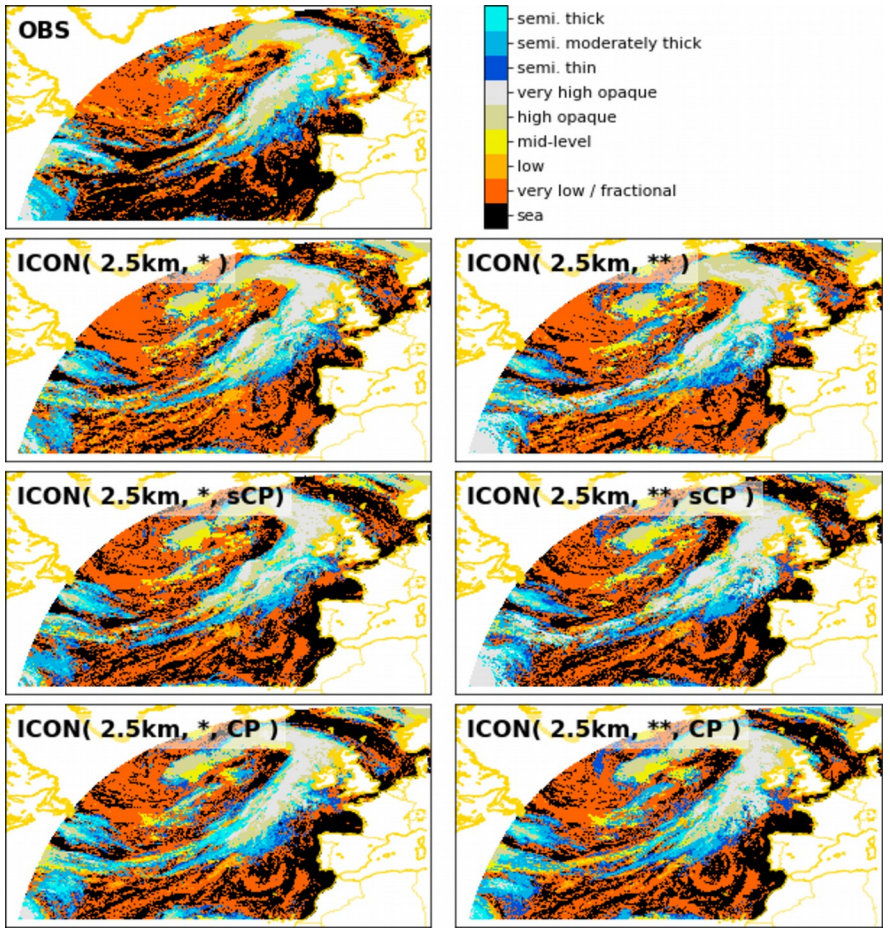
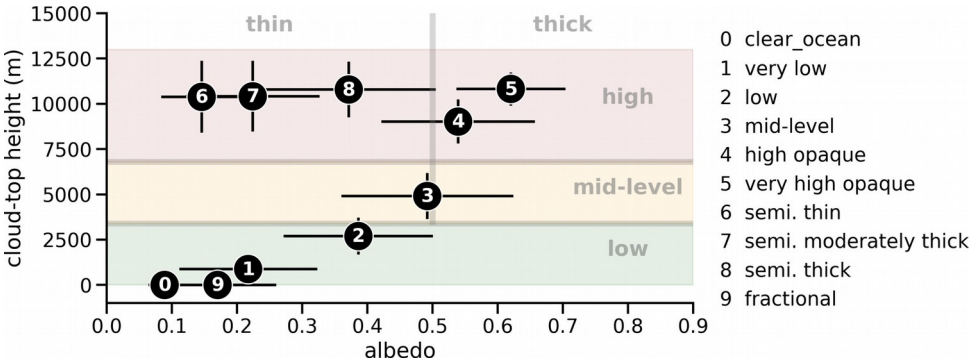
Consistent Cloud Typing Helps to Assess Quality of Cloud Simulation





- cloud typing applied to **multi-spectral** infrared SEVIRI observations & synthetic satellite images
- opaque cloud types separated by their cloud-top height
- semi-transparent cirrus distinguished by optical thickness

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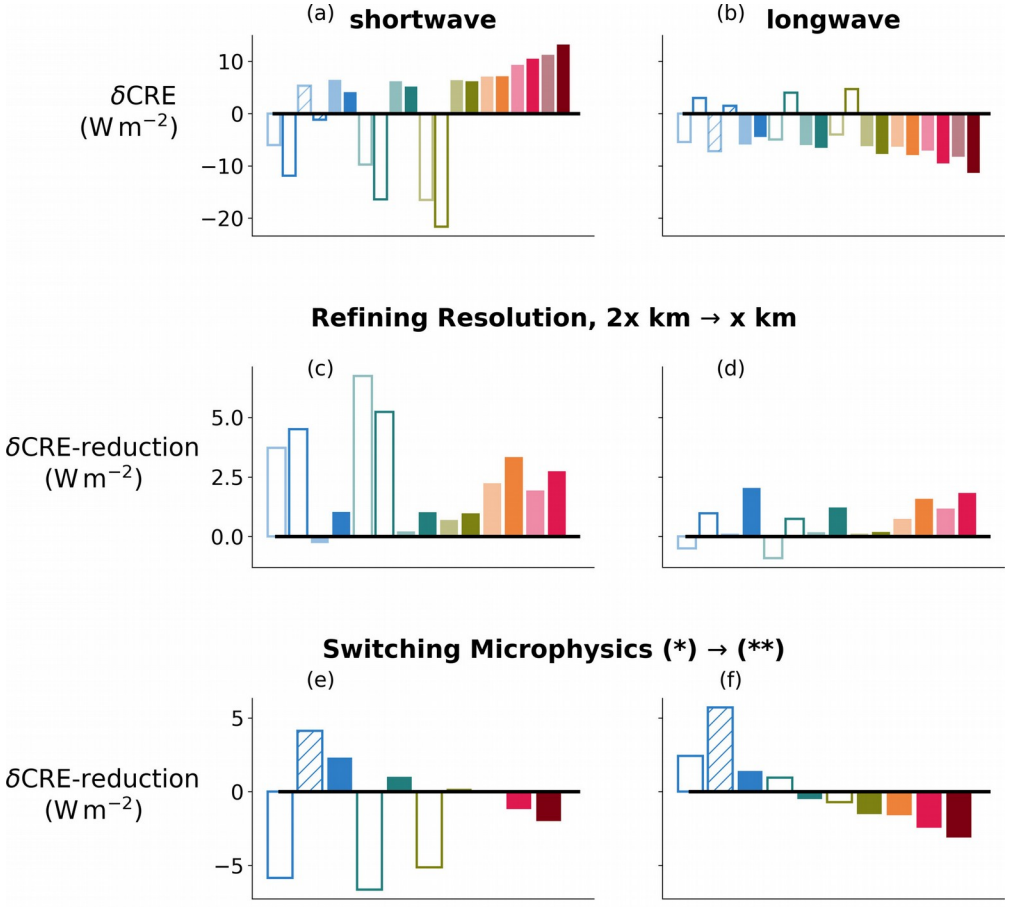
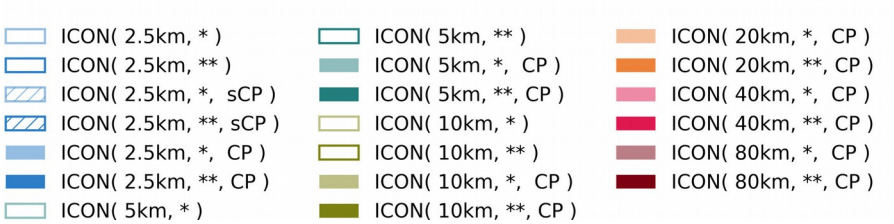
How does resolution and microphysics impact cloud-radiative effects (CRE) biases?





- refining resolution improves CREs
- switching to 2-moment microphysics only helps at higher resolutions

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