

High-Resolution Tropical Climate Modeling at ETH-Hymet

Shuchang Liu (PhD student)

Laureline Hentgen (former PhD student, left academia)

Christoph Heim (PhD student)

Roman Brogil (PostDoc)

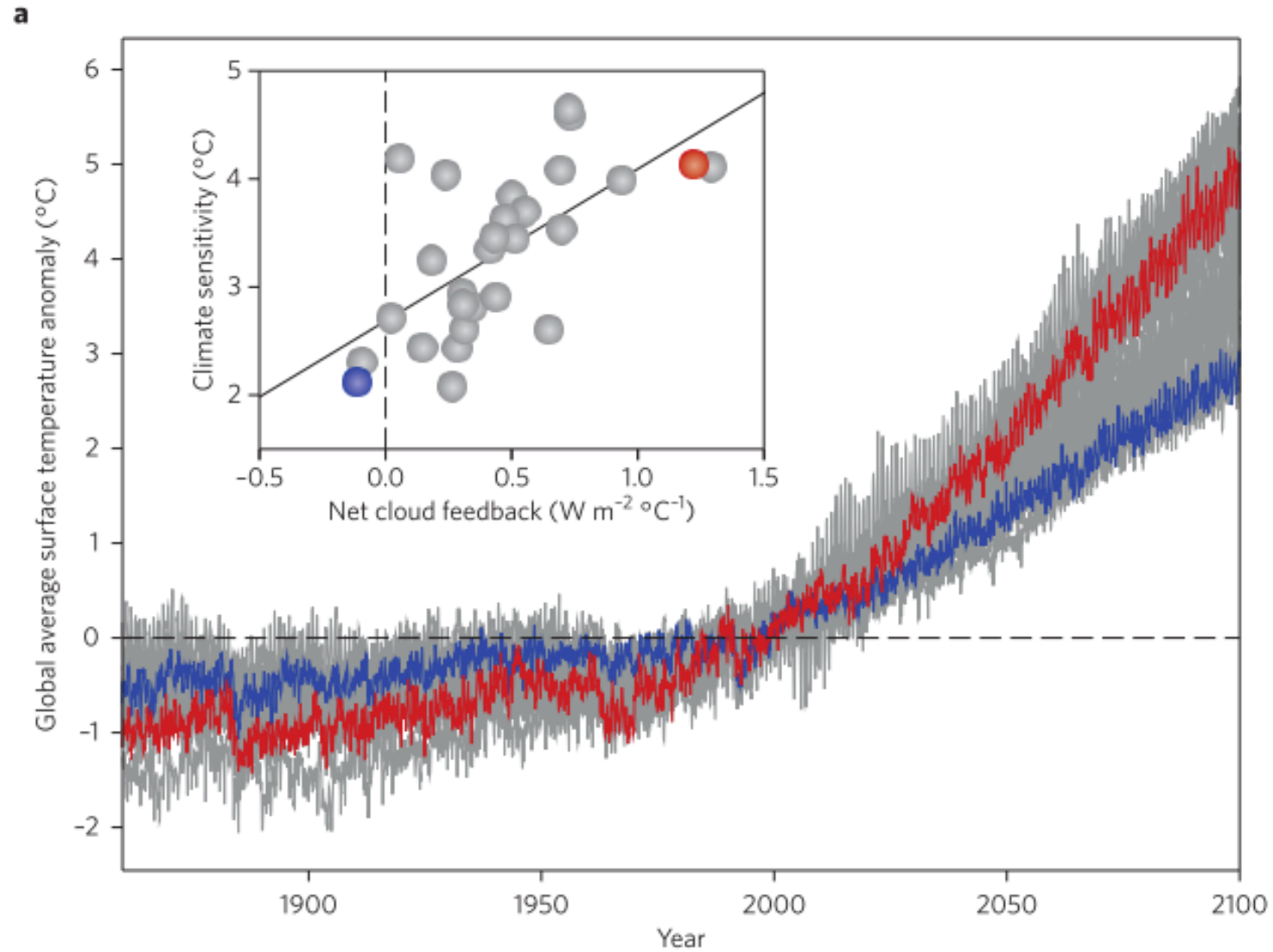
Jacopo Canton (ETH Fellow, PostDoc)

Silje Lund Sørland (Senior Scientist, Now at NORCE)

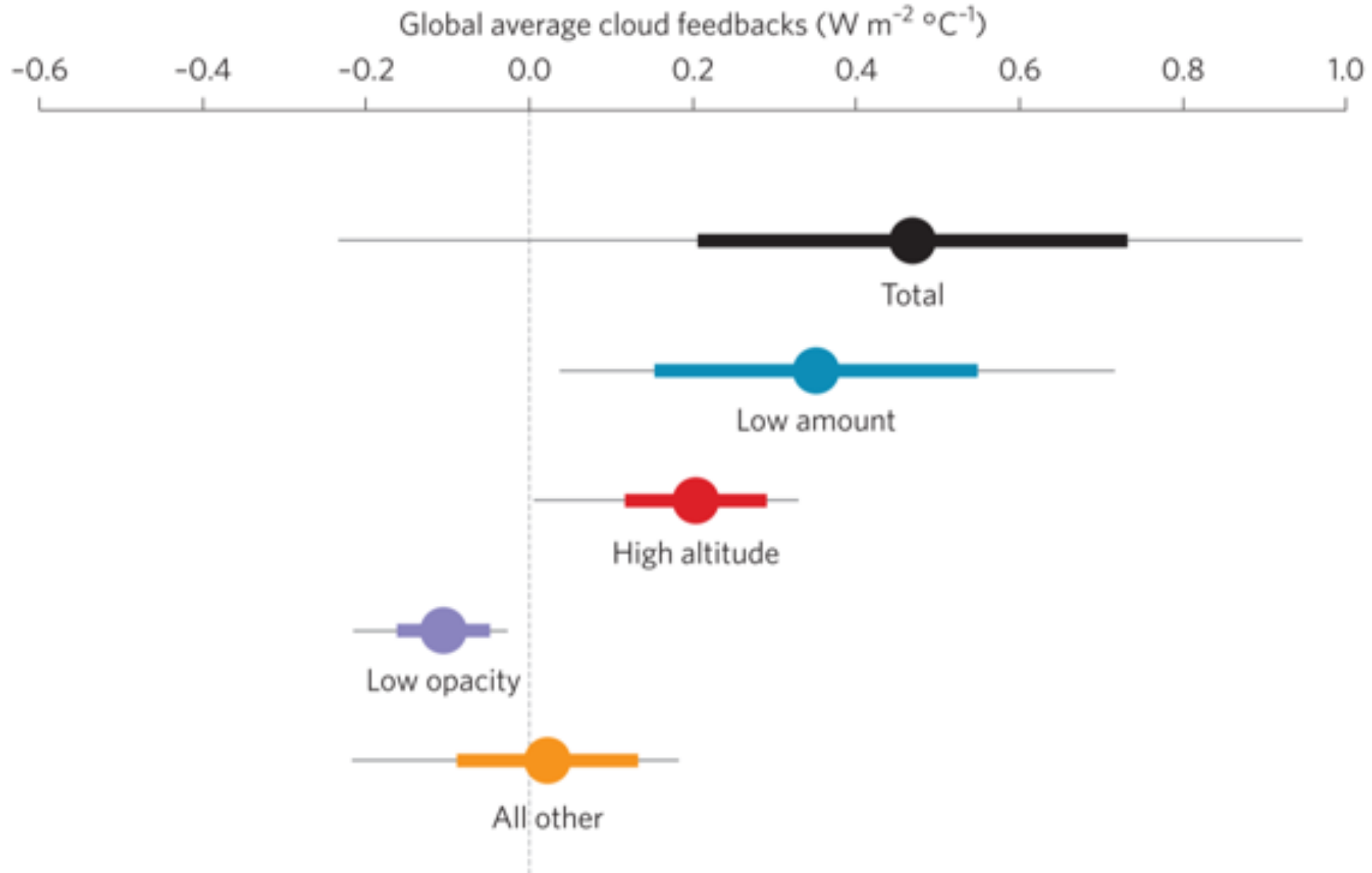
Christoph Schär (group leader)

Background:
«Seascape» by Gerhard Richter

Project Frame



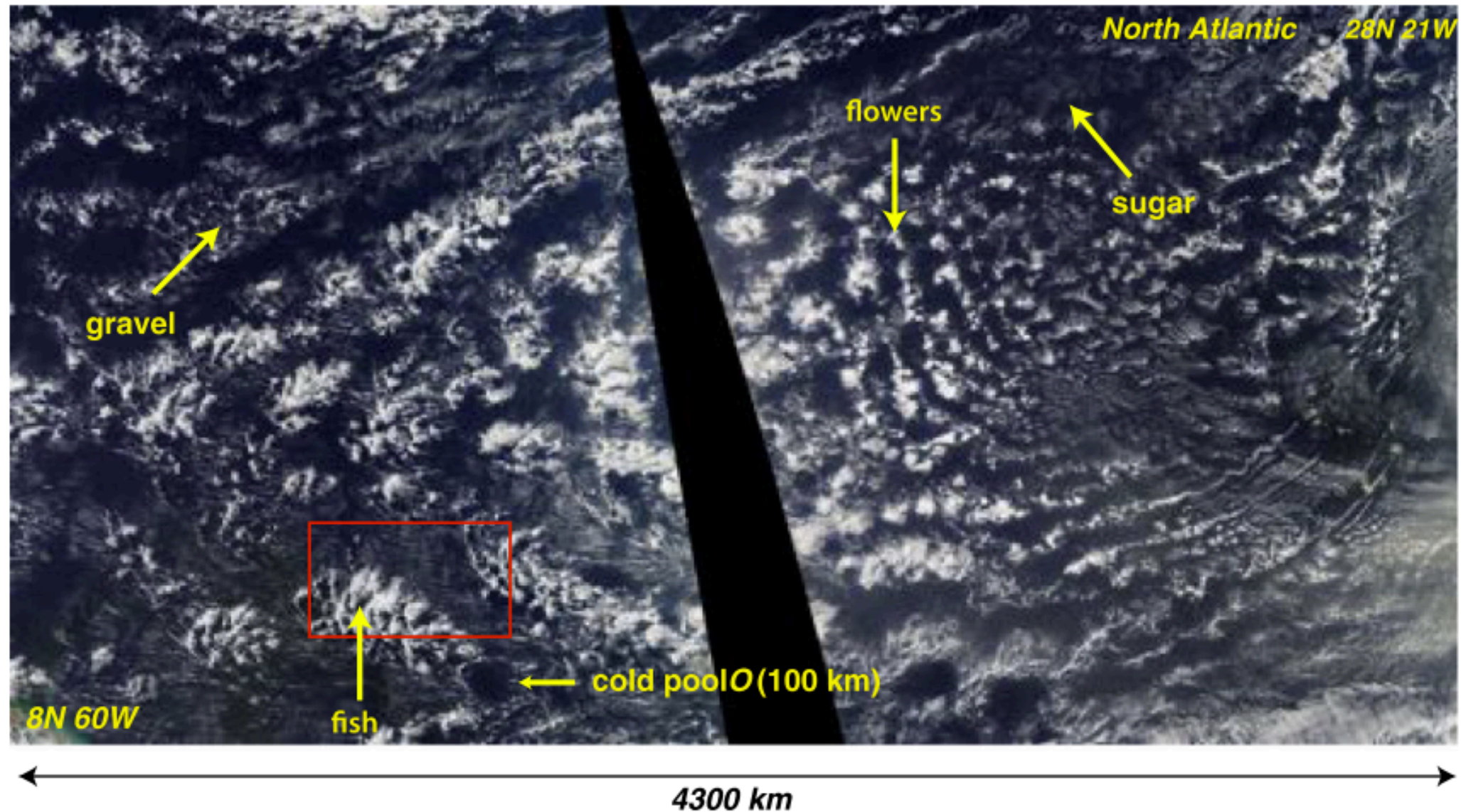
Project Frame



Zelinka et al., 2016,2017

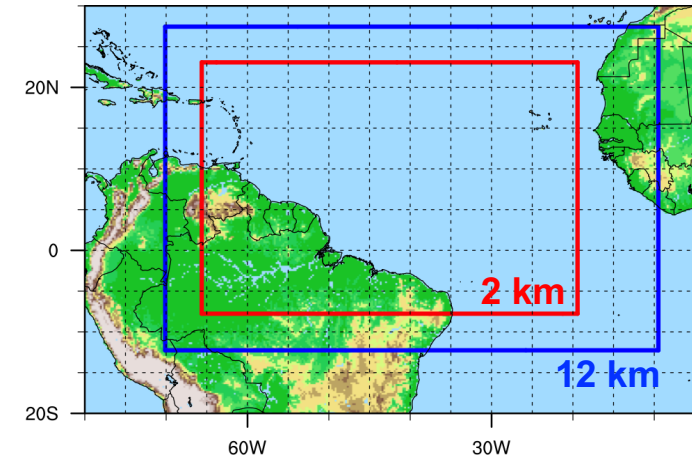
estimated feedback strength and model spread in a composite of 18 CFMIP1&2 models

Project Frame



Tropical clouds

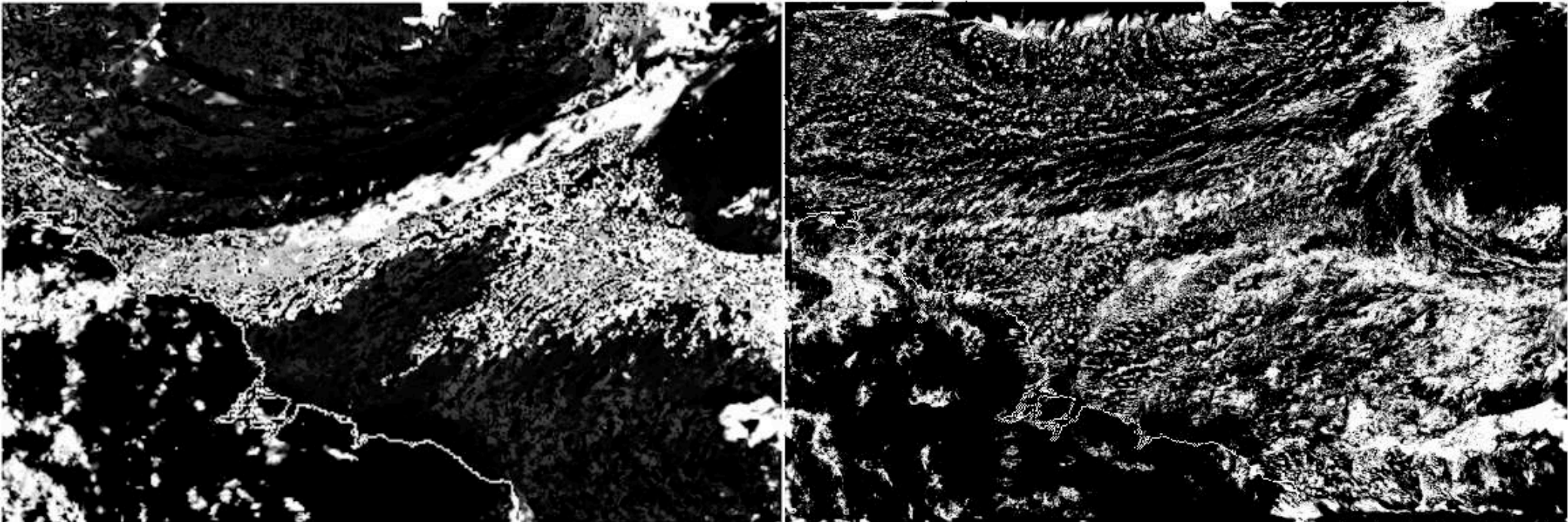
- Role of tropical clouds for climate sensitivity?
Can a 2-km model represent tropical cloud cover?
- Grid: 2304 x 1536 x 60
- $\Delta t = 20$ s
- Month-long simulations, driven by ERA-Interim.



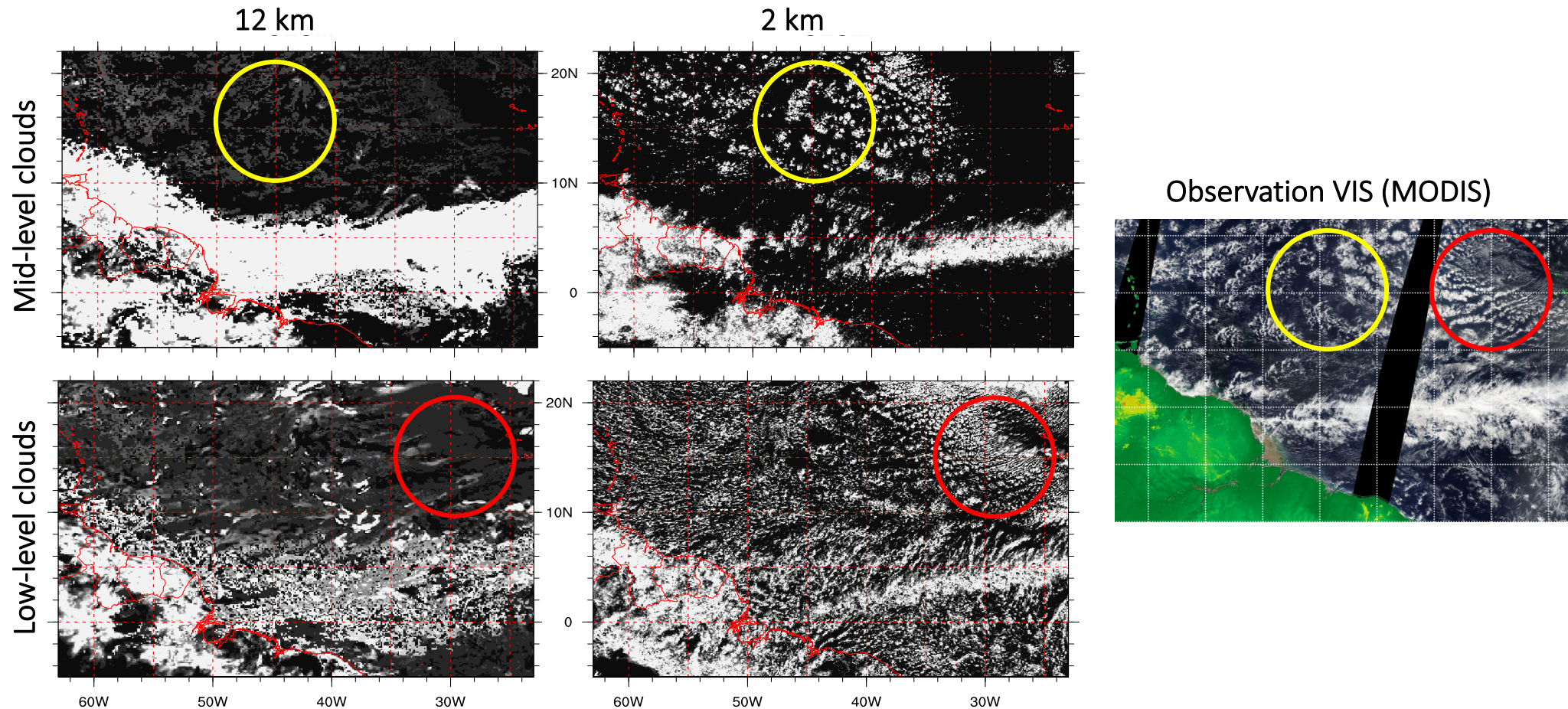
12 km

2013 DEC 01 00 UTC

2km



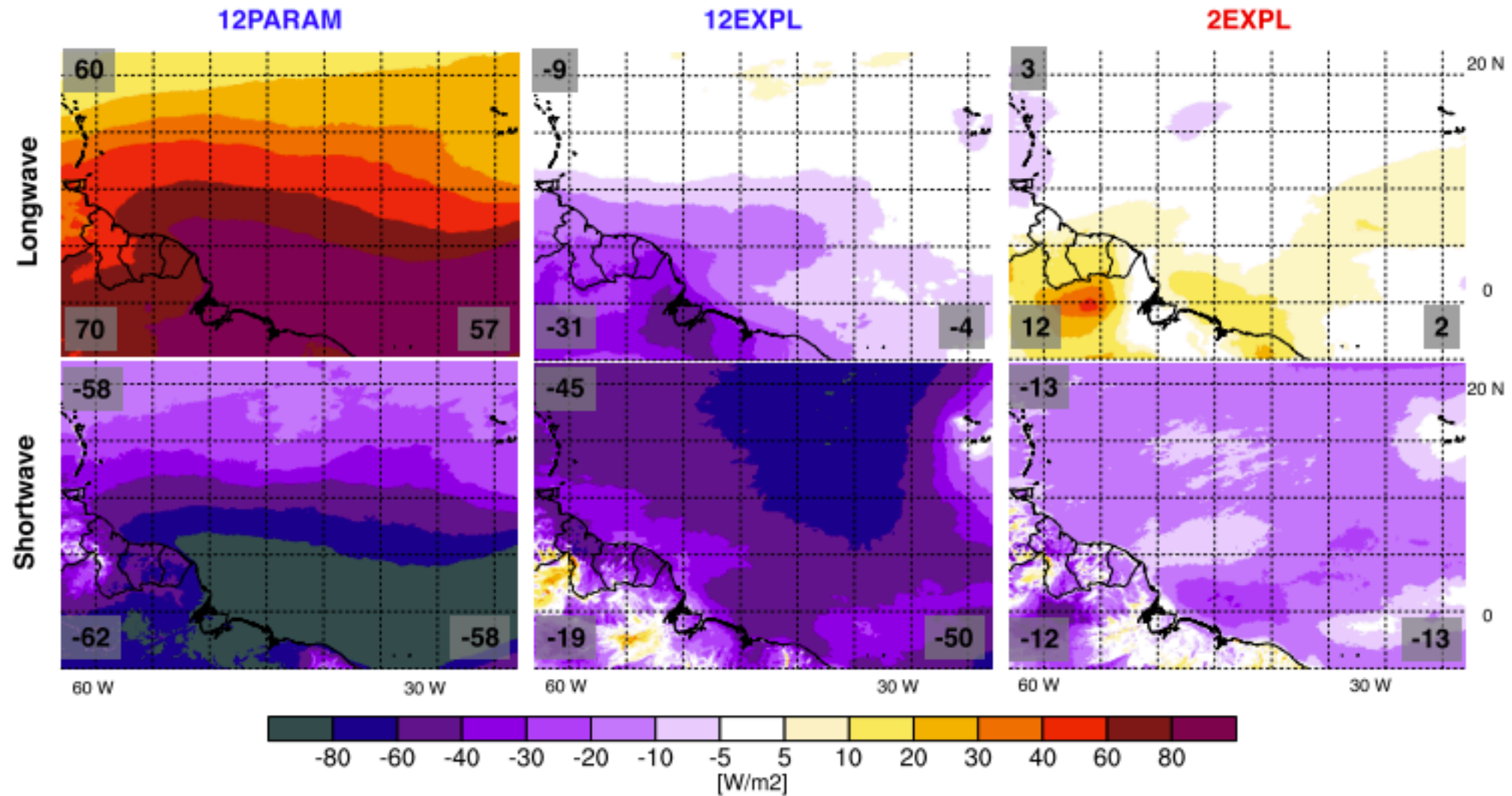
Mesoscale organization



Credibly captures some of the meso-scale cloud structures including interannual variability

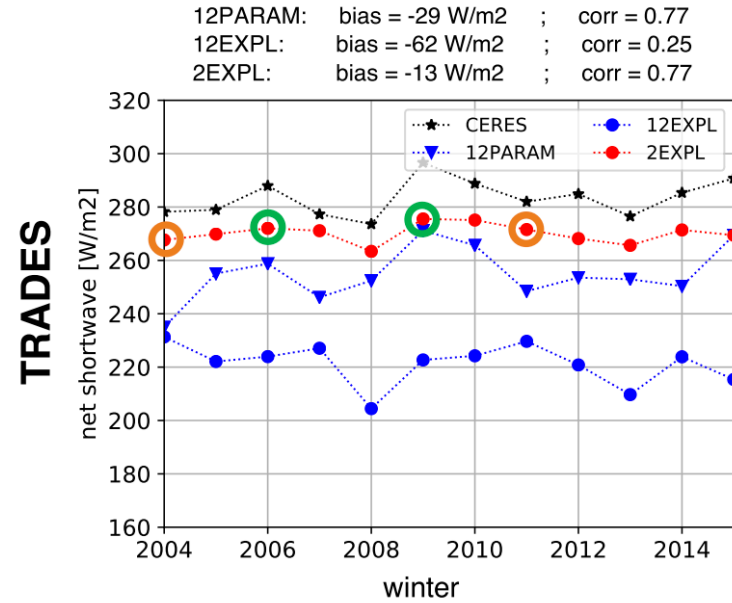
Dramatically improved radiation biases

Top-of-the-atmosphere radiation balance

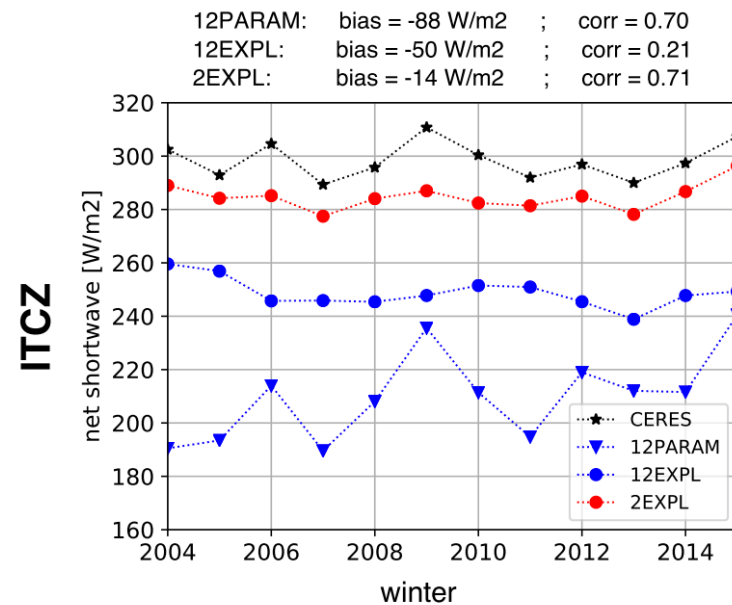


Strong reduction of top-of-the-atmosphere radiation biases

Tuning based on European climate



Can we do better with trough optimal tuning?



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**PhD student B: Objective model
calibration**

**PhD student A: Convection-Resolving
Simulations of Marine Low Clouds in the
subtropics of the Southern Atlantic**

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