

Realistic Lagrangian LES

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Purpose

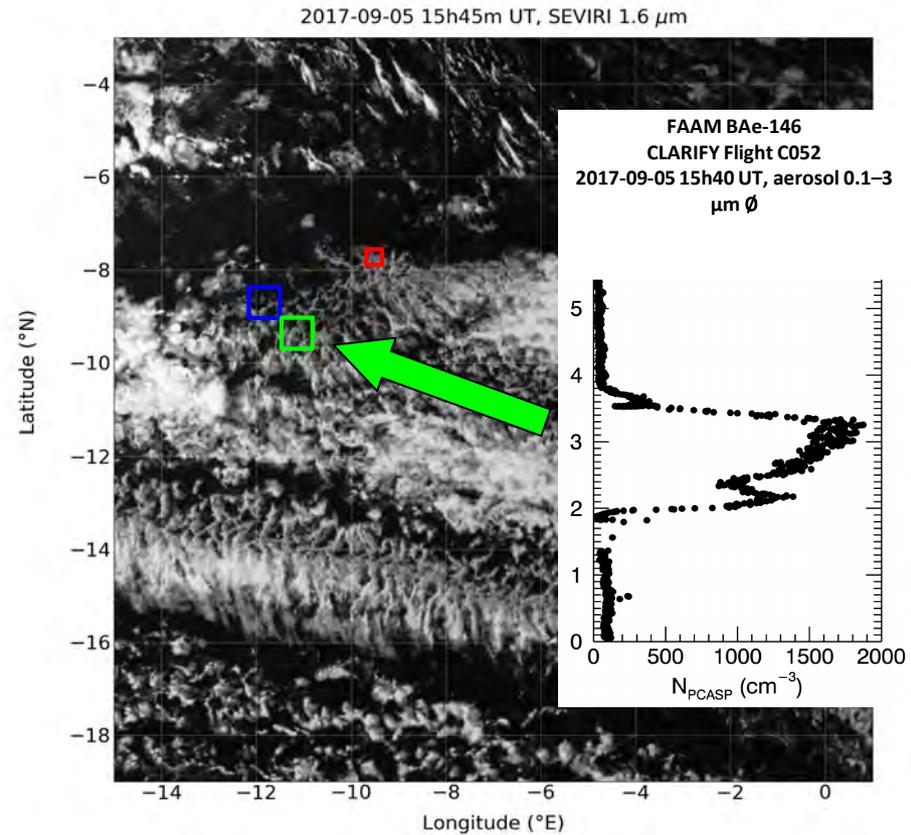
- Process studies
- Simulations accompanying field campaigns
- Support for
 - SCM/GCM development
 - Development of remote sensing retrieval algorithms accounting for 3D radiative transfer

Objective

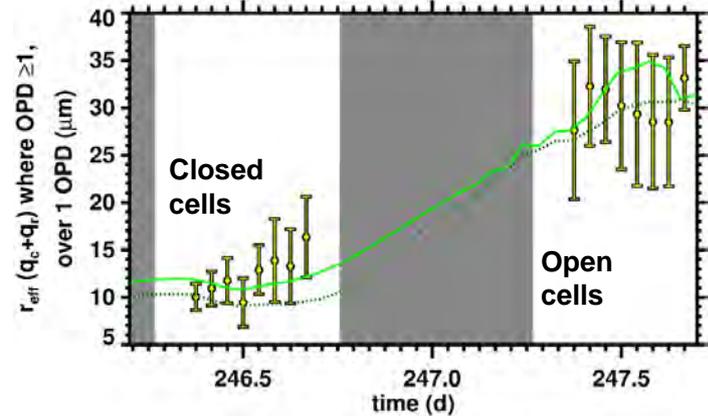
- Simulate the transition from an overcast Sc cloud deck to an open-cell Sc during the CLARIFY campaign
- Study the response of the cloud deck to biomass burning aerosol entrainment

Approach

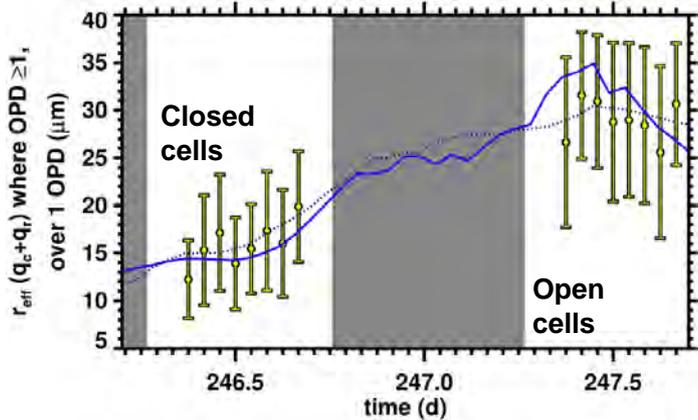
- SAM (System for Atmospheric Modeling)
- Follow trajectories in the boundary layer
- ERA5 meteorology and SST



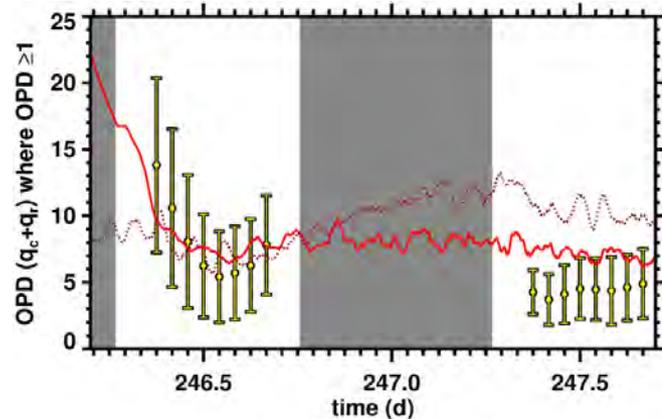
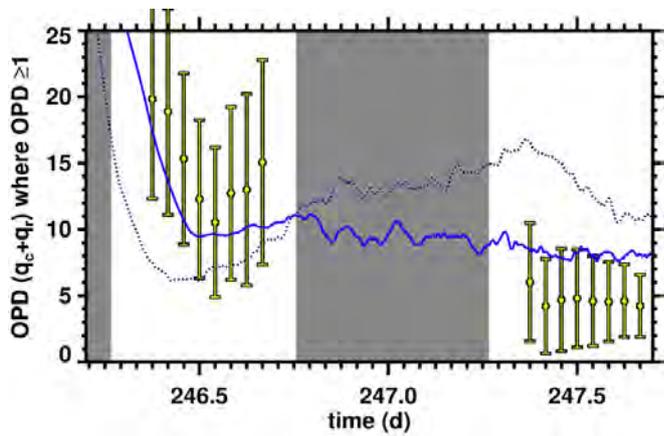
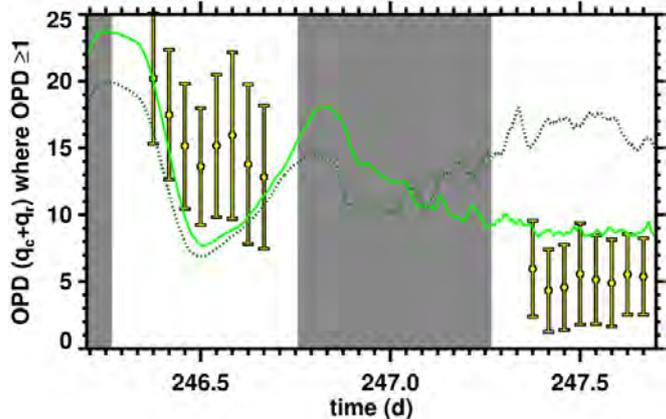
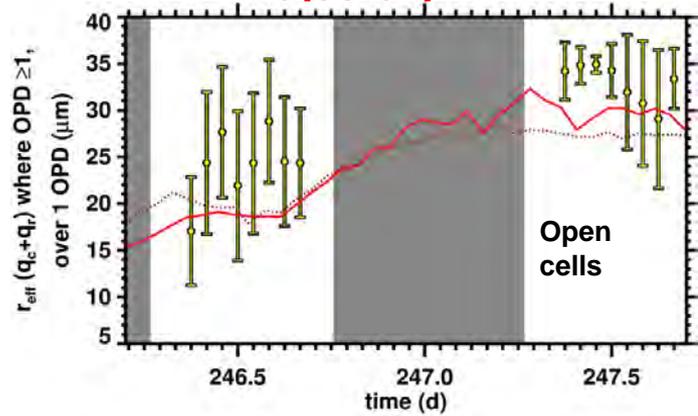
Green trajectory



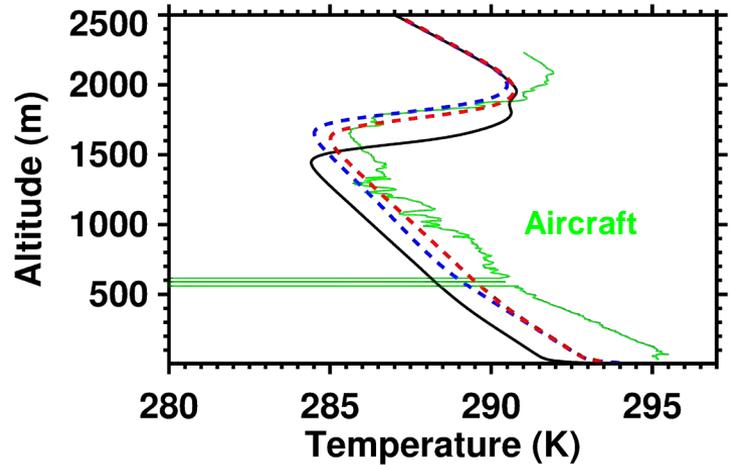
Blue trajectory



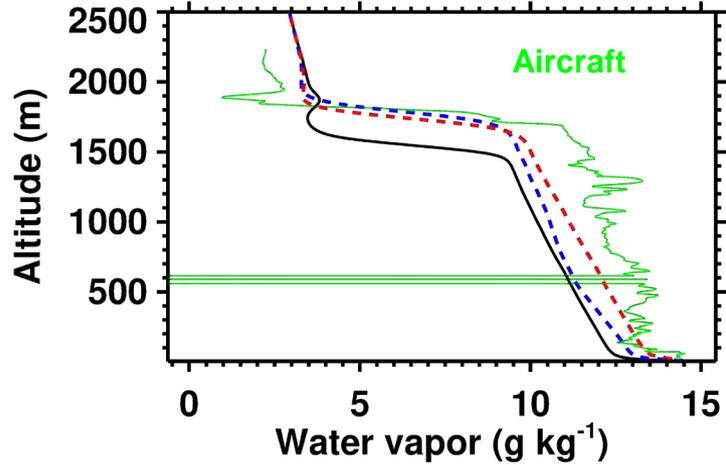
Red trajectory



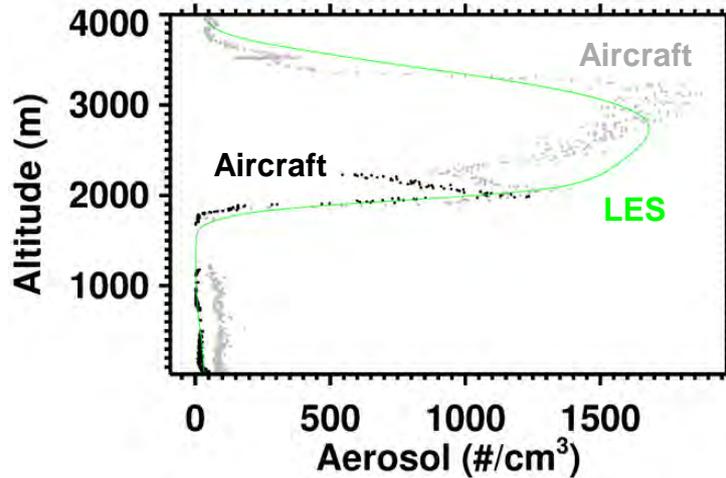
→ Bin cloud microphysics needed – improvements of bulk cloud microphysics possible?



- - Stronger nudging of horizontal wind speed + coarser resolution near surface
- - Stronger nudging of horizontal wind speed near surface
- mean simulation



→ Setup of LES matters for realism – better understanding required

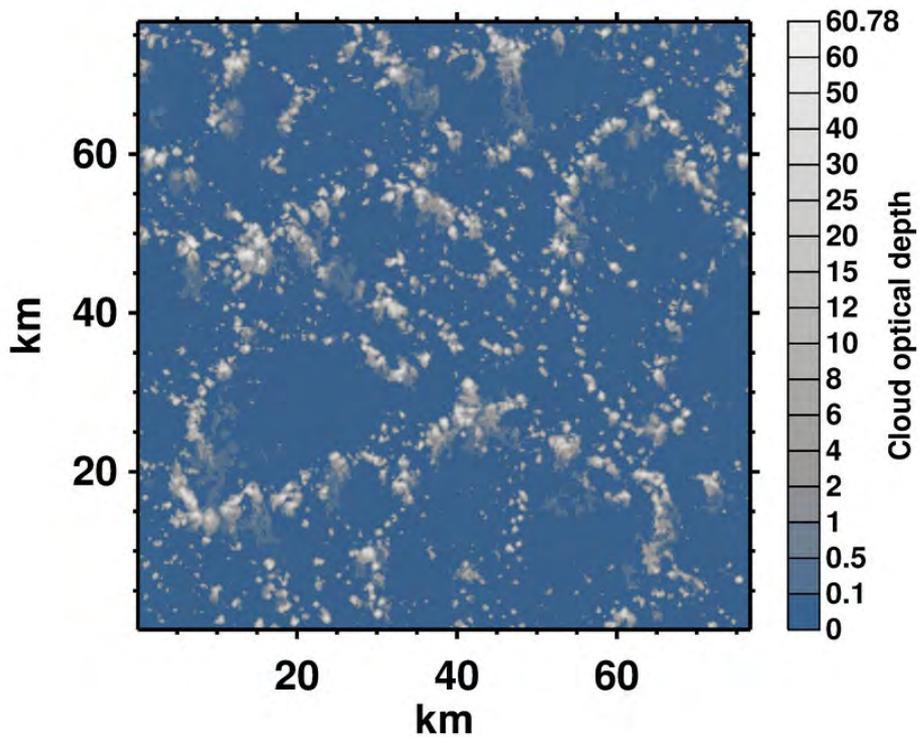


→ More systematic evaluation of LES in the SEA, using observations from LASIC?

Biomass burning aerosol entrainment into the boundary layer

Cloud optical depth

September 5, 15h51m00s UT



Cloud optical depth

September 5, 15h51m00s UT

