

Spatial Scales of Organisation in Southern Ocean Stratocumuli

Friday, 7 May 2021 16:00 (1h 45m)

Mesoscale-cellular convective (MCC) organisation is frequently observed in Southern Ocean (SO) stratocumuli, which exert a climate relevant cloud radiative effect in this region. Furthermore, many of these clouds are not pure liquid clouds, but contain a mixture of ice and liquid.

McCoy et al. (2017) demonstrated that the cloud albedo and thus the shortwave cloud-radiative effect of SO stratocumuli differs between different MCC manifestations. At identical cloud fraction closed-cell stratocumuli are more reflective than open-cell stratocumuli.

We investigate whether cloud phase influences MCC organisation patterns and whether such changes can be associated with substantial cloud-radiative effects. For this we are currently building and testing an algorithm identifying cellular organisation and distribution of cell size in shortwave radiance retrievals from MODIS. During this process we have tried different segmentation techniques. We currently obtain the most promising results applying the random walker (image) segmentation method in combination with a neural network classification from Wood and Hartmann (2006).

At this workshop we will present the skill and limitation of this approach in obtaining cell-size statistics within the open- and closed-cell regime as well as first scientific results regarding the cloud phase distributions in open- and closed-cell SO stratocumuli.

Primary authors: DANKER, Jessica (Goethe-University); Dr SOURDEVAL, Odran (Lille University); Dr GLASSMEIER, Franziska (Wageningen University); POSSNER, Anna (Goethe University)

Presenter: DANKER, Jessica (Goethe-University)

Session Classification: Organisation in Shallow Convection

Track Classification: Organisation in Shallow Convection