



Convective clouds induced by land surface heterogeneities

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Land-surface atmosphere interactions at regional scales are often difficult to characterize due to the difficulty of observing surface fluxes and states of the atmospheric boundary layer routinely, at scales exceeding the footprint of eddy covariance sensors, and across various land use types including forests and cities. Convective clouds can be seen as tracers of surface energy balance partitioning, and they can be observed routinely at regional to continental scales by weather satellites. As such, any preferred cloud formation linked to land surface heterogeneities can be used to infer flux partitioning at the land surface. Here, I will provide an overview of past and ongoing work focussed on understanding the role of land surface conditions and energy balance partitioning on preferred cloud formation. These include: a) an observation-based assessment of preferred cloud formation over European forests using routine satellite observations from MSG (Teuling et al., 2017), b) a model sensitivity study using large eddy simulation to infer sensitivity of cloud formation to surface energy balance partitioning (Bosman et al., 2019), c) an observation-based study focussed on enhanced cloud formation over European cities, and d) a study on the impacts of enhanced cloud formation on local planetary albedo.

References

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