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Diurnal cirrus cloud variability observed above Reunion Island: case study

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The cirrus cloud effect, in term of radiative impact (cooling or warming), is not easy to evaluate because neither the microphysical properties nor the optical properties are sufficiently well parameterized in global climate model. The reason why it is a hard task to characterize them is that many processes interact and play a undeniable role at different scales in their life cycle. The cirrus cloud maintain outcome from thin equilibrium between different processes and interactions between them and also depend on the meteorological context and feedback processes.

One of the key point regarding the cirrus cloud impact evaluation on the temperature of the atmosphere concern the cirrus cloud life cycle and the processes and mechanisms studies that contributes to the evolution of the cloud.

In January 2004, lidar observations have been operated at sunrise from the "Laboratoire de Physique de l'Atmosphère" in Reunion Island. Cirrus cloud evolution has been analyzed from lidar measurement, in conjunction with meteorological analysis and simulations from the French Meso-NH Atmospheric Simulation System. The capability of the model to simulate the impact of the cloud on the atmosphere, and inversely, have been assessed by direct comparison between radiative transfer code calculations and simulations results.