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# Sub-scale cirrus investigations in South of France

J. Jumelet (1), P. Keckhut (1), G. Thuillier (1), J-M. Perrin (2), N. Montoux (1), C. Hoareau (1), F. Huppert (2), A. Hauchecorne (1), S. Bekki (1), and C. David (1)

(1) Institut Pierre Simon Laplace, service d'Aéronomie, Verrieres-le-buisson, France (keckhut@aerov.jussieu.fr), (2) Observatoire de Haute-Provence, France

Multi-instrumental site are valuable to better characterize the processes of cloud formation and take into account the different scales. Systematic lidar measurements have been performed since 1994 in Observatoire of Haute-Provence in the South of France. Cluster Methods on morphologic parameters allows us to identify three different cirrus classes. One class corresponds to thin clouds around the local tropopause. These sub-grid-scale cirrus have been simulated using isentropic numerical simulations and the potential source of stratosphere hydratation associated with these cirrus events have been also investigated. The optical depth variability is also a discriminated parameters that could help to investigate the sub-scale variability in numerical models while the radiative modeling reveals than broken cloud has different effects than uniform behavior. Pyranometers (total and UVB), daytime all sky camera, and sun-spectrometer have been implemented to estimate the radiative effects at ground level. More specific results will be presented through an associated poster in the same session (Thuillier et al.).