



## **Development of a new approach of the lidar and IR radiometer synergy in the CALIPSO validation framework**

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In the framework of the CALIPSO validation programme, the OPAR station, in the south hemisphere, was chosen for the French tropical validation site. The actual multi-lidar systems station has been completed with an Infrared radiometer, with the same spectral band ( $8.7\mu\text{m}$ ,  $10.5\mu\text{m}$  et  $12.0\mu\text{m}$ ) as the one on board CALIPSO, in order to observe the cloud scene with the same instrumental technique. The lidar and IR radiometer synergy offer the capability, via the split-window technique, to infer the cirrus microphysical property. Indeed, absorption and diffusion phenomena in the ice crystal give different brightness temperature in the chosen wavelength. The difference between those brightness temperatures forms arches that contain information on particles size. The classical approach is to simulate with a radiative transfer code an infinite arches making assumption on cloud models to retrieve the arches that better fit the observation. The newer approach is among the radiative transfer code, to analyse the sensitivity and the incertitude of the code to produce paramétrisations of the brightness temperature calculation to be use in an optimal estimation method. In this way, the split window technique could be automated.