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Titolo	Global scale investigation of cirrus clouds properties using active and passive sensors [Tesi di dottorato]
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Note	In relazione con <a href="http://amsdottorato.unibo.it/5716/">http://amsdottorato.unibo.it/5716/</a>
Sommario	<p>A year of satellite-borne lidar CALIOP data is analyzed and statistics on occurrence and distribution of bulk properties of cirri are provided. The relationship between environmental and cloud physical parameters and the shape of the backscatter profile (BSP) is investigated. It is found that CALIOP BSP is mainly affected by cloud geometrical thickness while only minor impacts can be attributed to other quantities such as optical depth or temperature. To fit mean BSPs as functions of geometrical thickness and position within the cloud layer, polynomial functions are provided. It is demonstrated that, under realistic hypotheses, the mean BSP is linearly proportional to the IWC profile. The IWC parameterization is included into the RT-RET retrieval algorithm, that is exploited to analyze infrared radiance measurements in presence of cirrus clouds during the ECOWAR field campaign. Retrieved microphysical and optical properties of the observed cloud are used as input parameters in a forward RT simulation run over the 100-1100 <math>\text{cm}^{-1}</math> spectral interval and compared with interferometric data to test the ability of the current single scattering properties database of ice crystal to reproduce realistic optical features. Finally a global scale investigation of cirrus clouds is performed by developing a collocation algorithm that exploits satellite data from multiple sensors (AIRS, CALIOP, MODIS). The resulting data set is utilized to test a new infrared hyperspectral retrieval algorithm. Retrieval</p>

products are compared to data and in particular the cloud top height (CTH) product is considered for this purpose. A better agreement of the retrieval with the CALIOP CTH than MODIS is found, even if some cases of underestimation and overestimation are observed.

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Localizzazioni e accesso

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