# Article information:

Remote sensing of cirrus cloud microphysical properties using spectral measurements over the full range of their thermal emission - Palchetti - 2016 - Journal of Geophysical Research: Atmospheres - Wiley Online Library
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# Article summary:

1. Cirrus clouds have a significant impact on the Earth's energy balance and their infrared properties are important for modeling high-altitude tropospheric cooling.

2. Spectral measurements covering both the long-wavelength infrared (LWIR) and far infrared (FIR) regions are necessary for a complete characterization of cirrus clouds, but such measurements are lacking.

3. A cirrus cloud model based on single-scattering properties database can be used to characterize cirrus clouds using spectral measurements acquired by ground-based campaigns. The effective particle diameter is more sensitive to variation in the FIR region than in the LWIR region, highlighting the importance of making FIR measurements.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article discusses the importance of measuring the full spectral range of thermal emission from cirrus clouds to accurately model their radiative properties and estimate their impact on the Earth's energy balance. The authors use a cirrus cloud model based on infrared single-scattering properties to analyze measurements acquired by the REFIR-PAD Fourier transform spectroradiometer during ground-based campaigns in the Italian Alps.

The article provides a thorough explanation of the optical parameters that affect cirrus cloud radiative properties, including extinction optical thickness, single-scattering albedo, and asymmetry factor. The authors also discuss how these parameters depend on microphysics and atmospheric conditions.

One potential bias in this article is that it focuses solely on the importance of measuring the full spectral range of thermal emission from cirrus clouds, without considering other factors that may affect their radiative properties. For example, it does not discuss how changes in atmospheric composition or temperature may impact cirrus cloud formation or behavior.

Additionally, while the article provides detailed information about the modeling approach used to analyze the REFIR-PAD measurements, it does not provide much information about potential limitations or uncertainties associated with this approach. It would be helpful for readers to have a better understanding of how reliable these models are and what factors may affect their accuracy.

Overall, this article provides valuable insights into the importance of measuring the full spectral range of thermal emission from cirrus clouds for accurate modeling of their radiative properties. However, readers should be aware of potential biases and limitations associated with this analysis.

# Topics for further research:

* Factors affecting cirrus cloud formation and behavior
* Impact of atmospheric composition on cirrus clouds
* Effect of temperature on cirrus cloud radiative properties
* Limitations of cirrus cloud modeling approaches
* Uncertainties in cirrus cloud radiative properties estimation
* Role of cirrus clouds in the Earth's energy balance

# Report location:

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