Cloud Observations during MAGIC with the Solar Spectral Flux Radiometer

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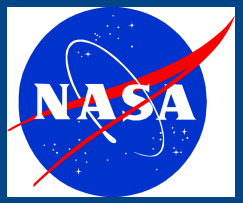
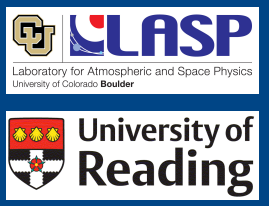




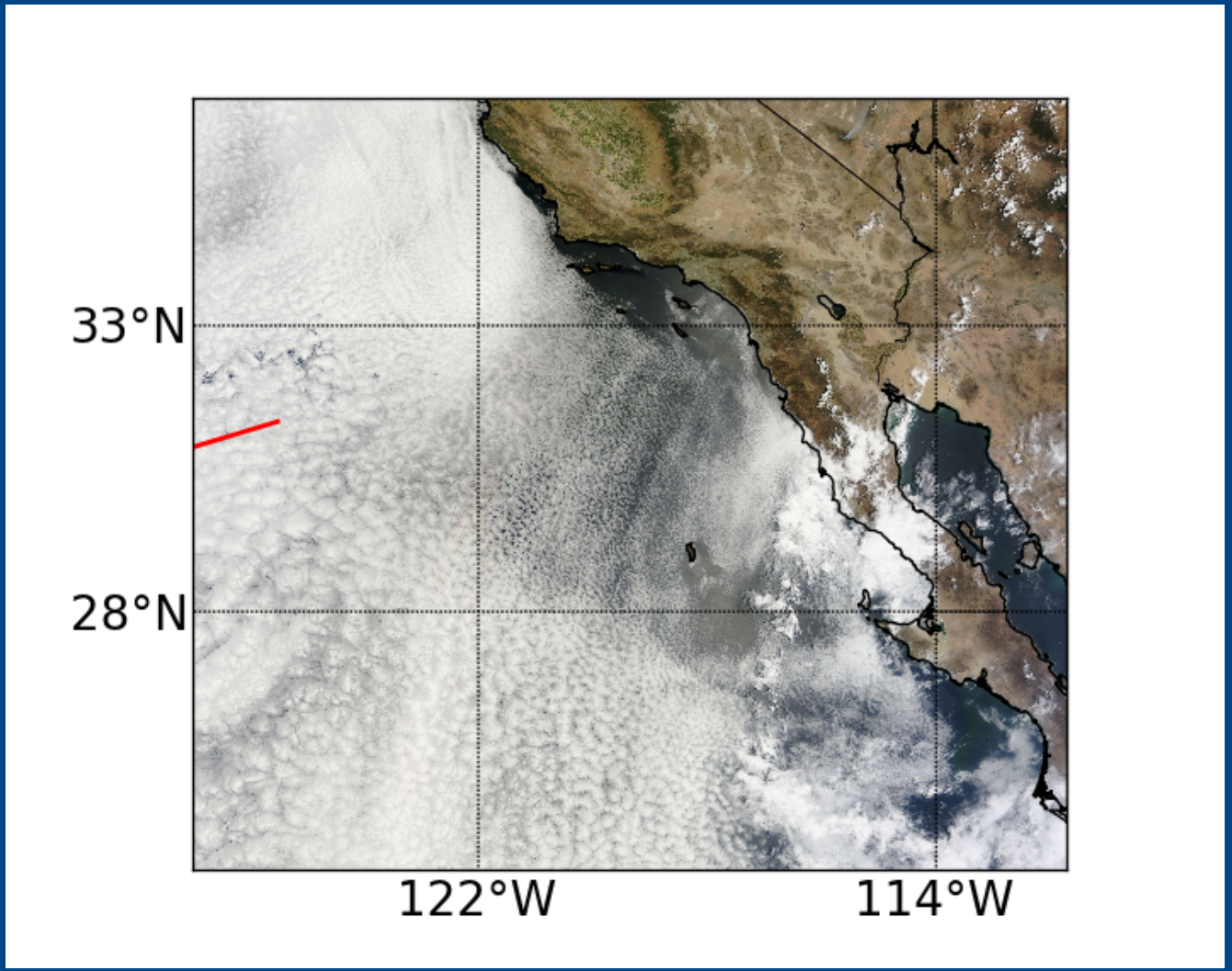
Solar spectral flux radiometer

Retrieval algorithm

- Uses radiance at 515 nm
- Exploits a contrast in water absorption in NIR to increase sensitivity to cloud particle size
- Plane parallel forward model

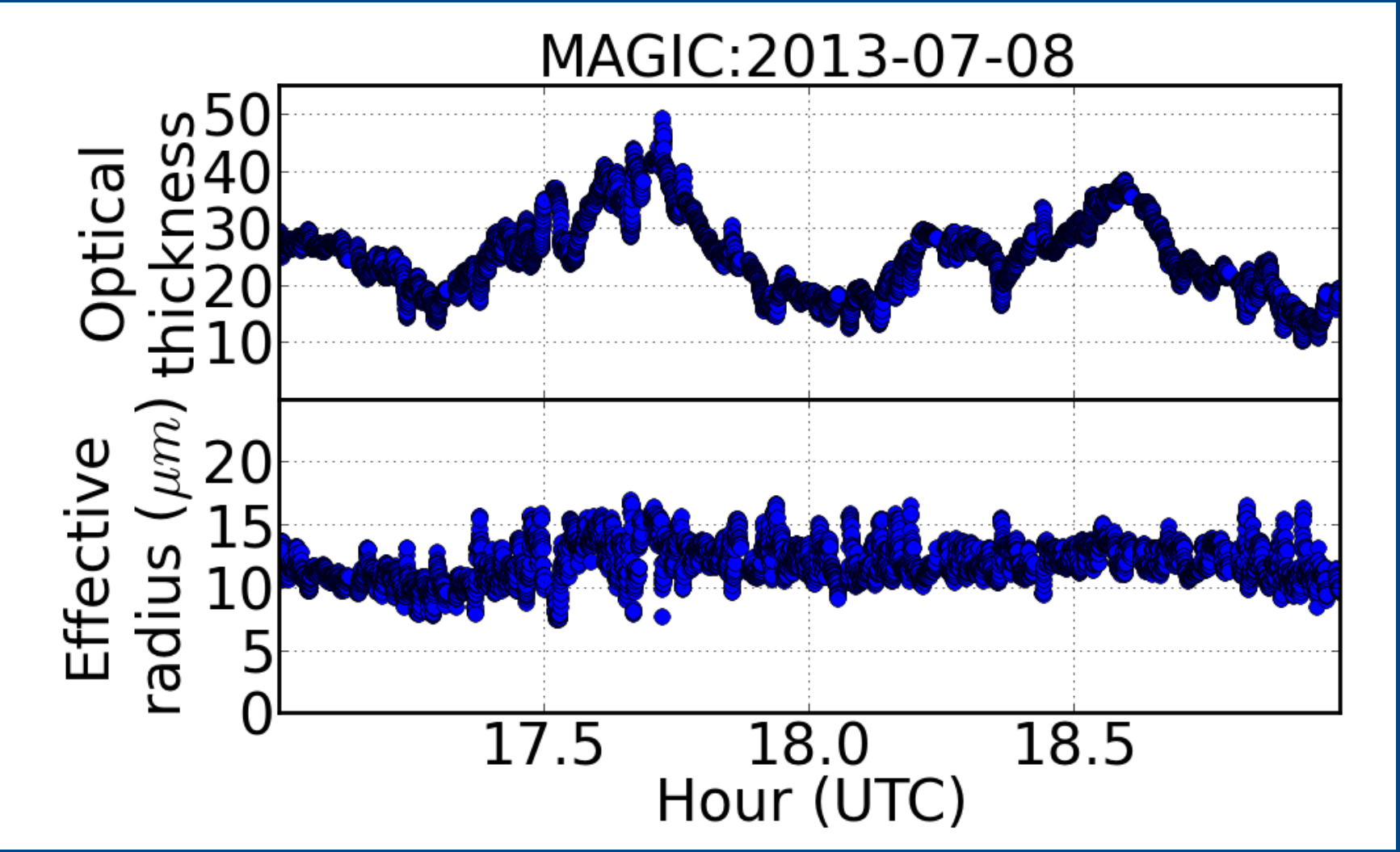
PJ McBride et al., ACP 2011

MODIS true color image

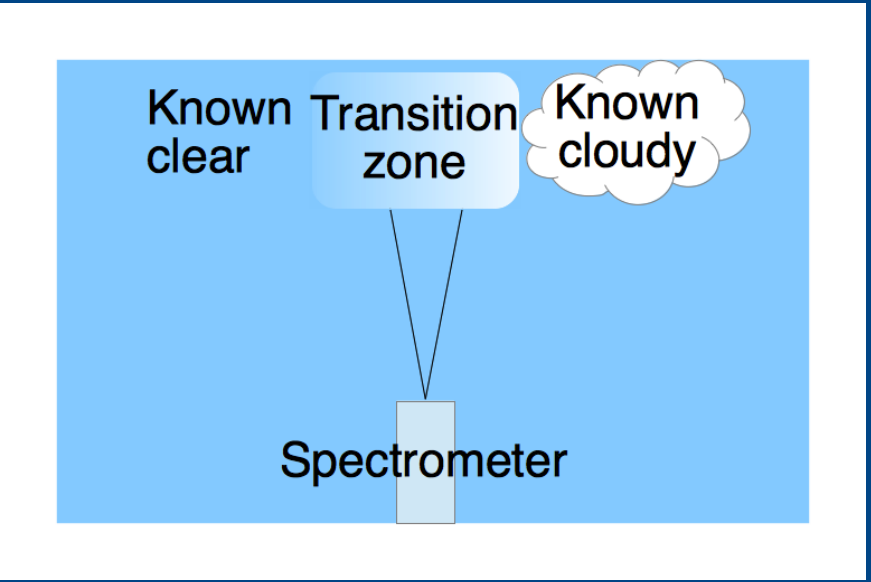


MODIS image from NASA/GSFC, Rapid Response

Cloud property retrievals



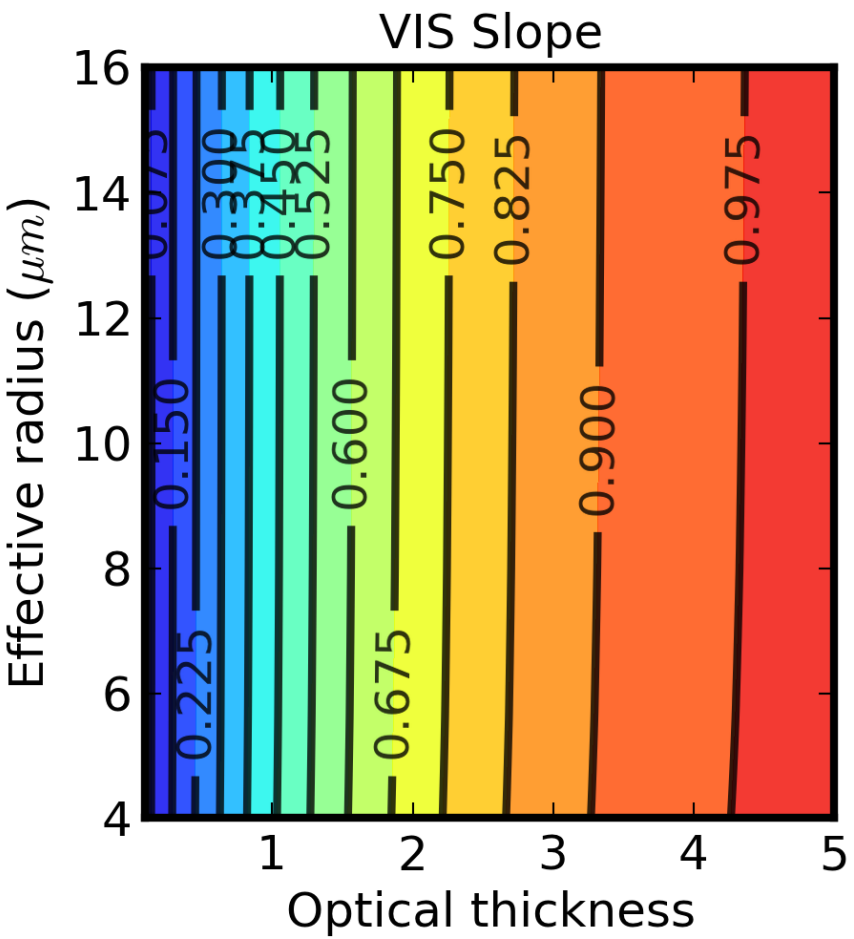
Cloud transition zone

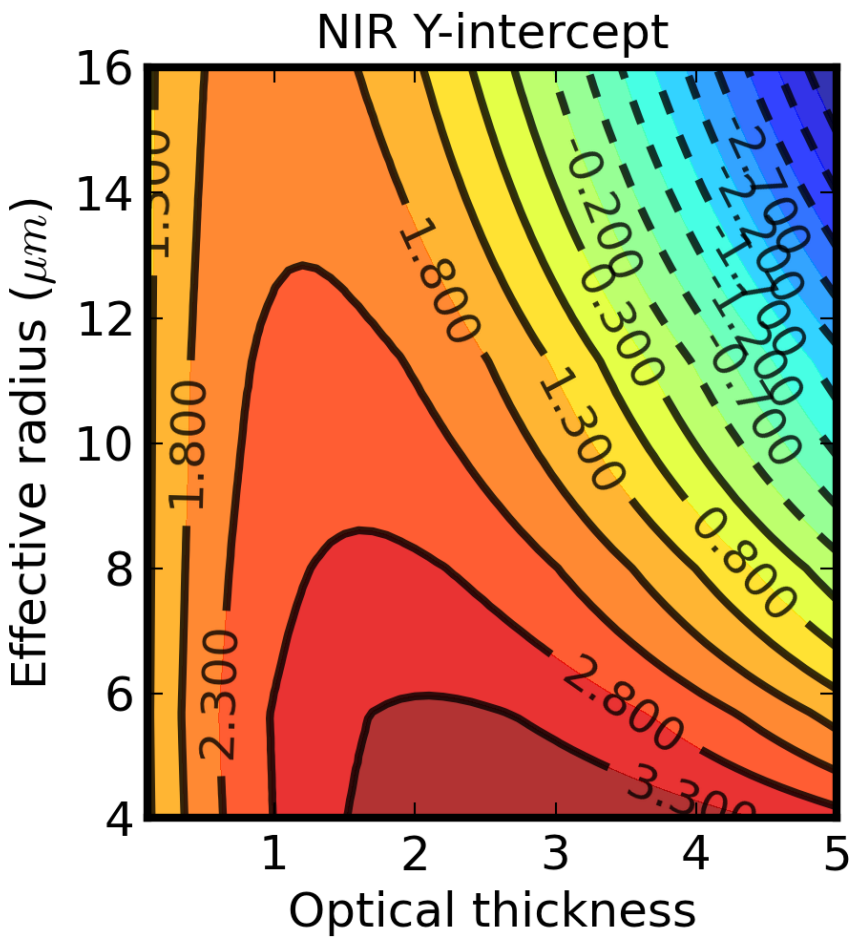


Retrieve **qualitative** cloud properties in the cloud transition zone using *m* and *b.*

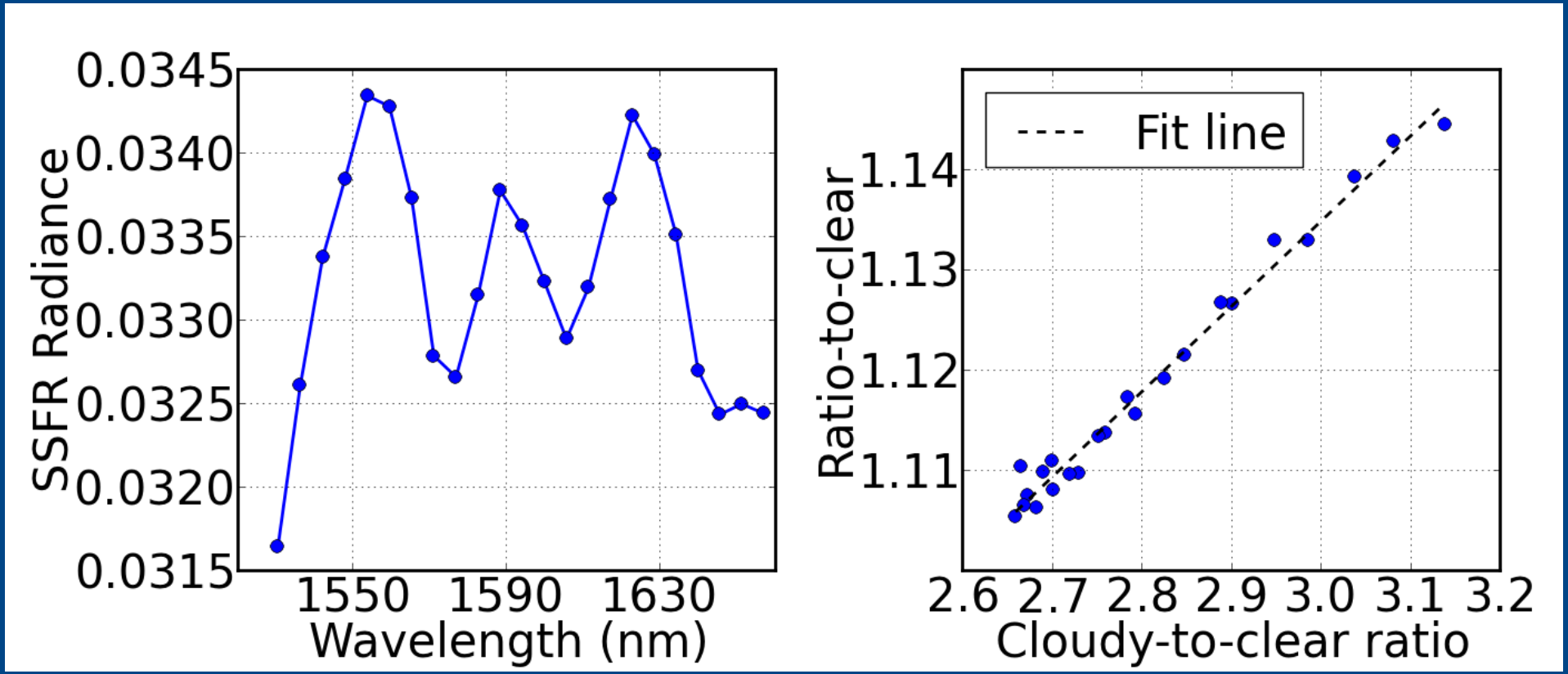
$$\frac{I_\lambda\left(t_{\text{transition\_zone}}\right)}{I_\lambda\left(t_{\text{known\_clear}}\right)} = \frac{I_\lambda\left(t_{\text{known\_cloudy}}\right)}{I_\lambda\left(t_{\text{known\_clear}}\right)} m + b$$

Modeled linear parameters

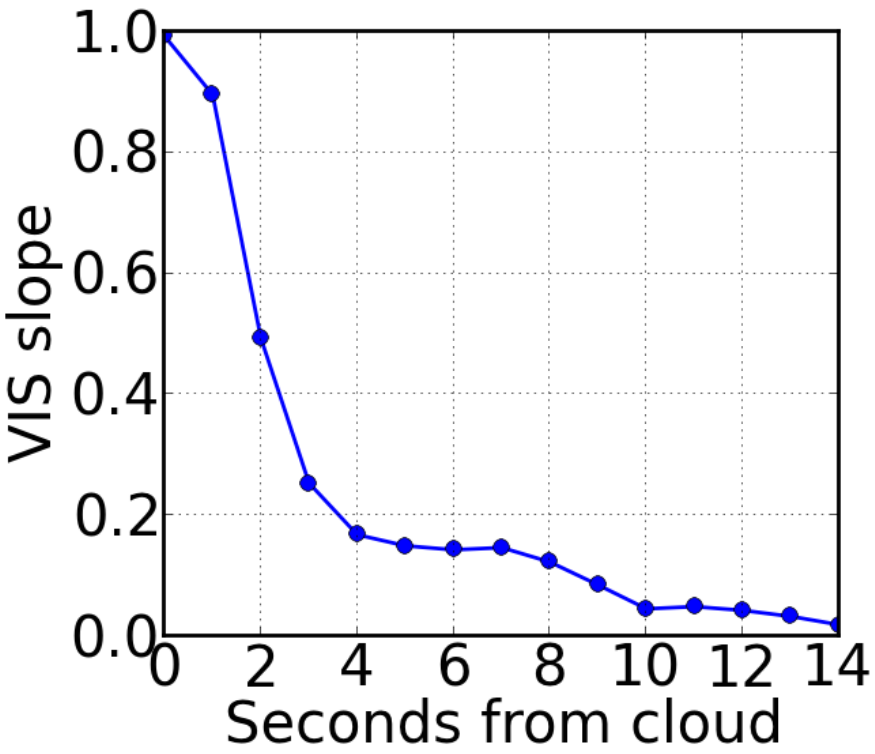


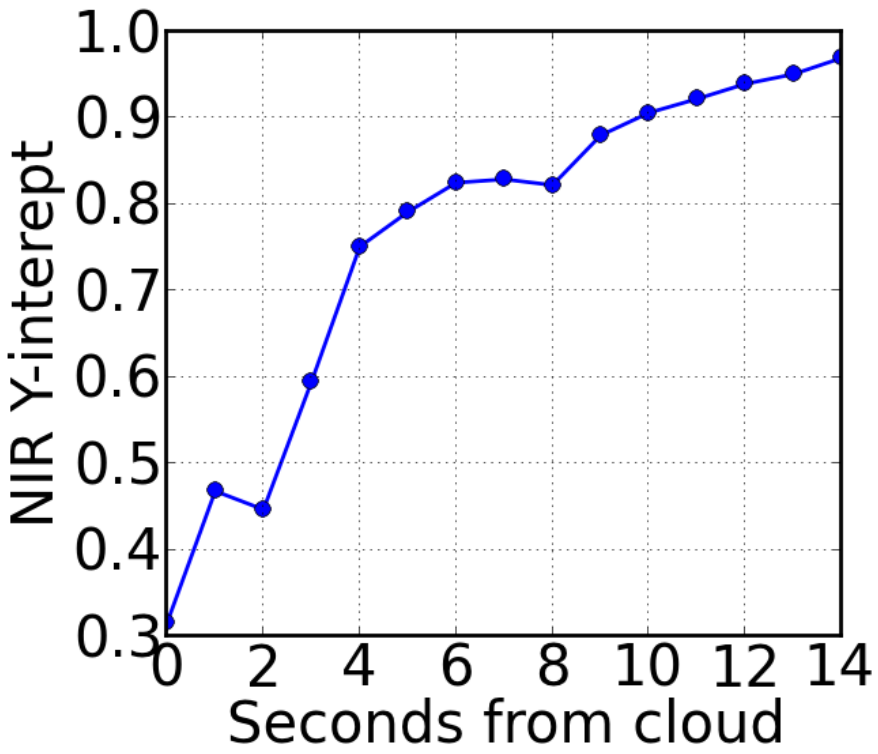


MAGIC cloud transition



MAGIC cloud transition





Summary

- Retrieving cloud optical thickness and particle size for overcast cases
- Studying the region between broken clouds with much work yet to be done
- Welcome any collaboration/validation efforts that we can find
- See more at the MAGIC poster session at AGU