

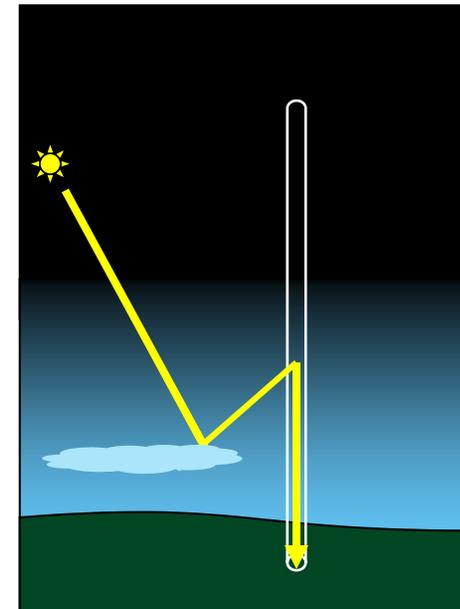
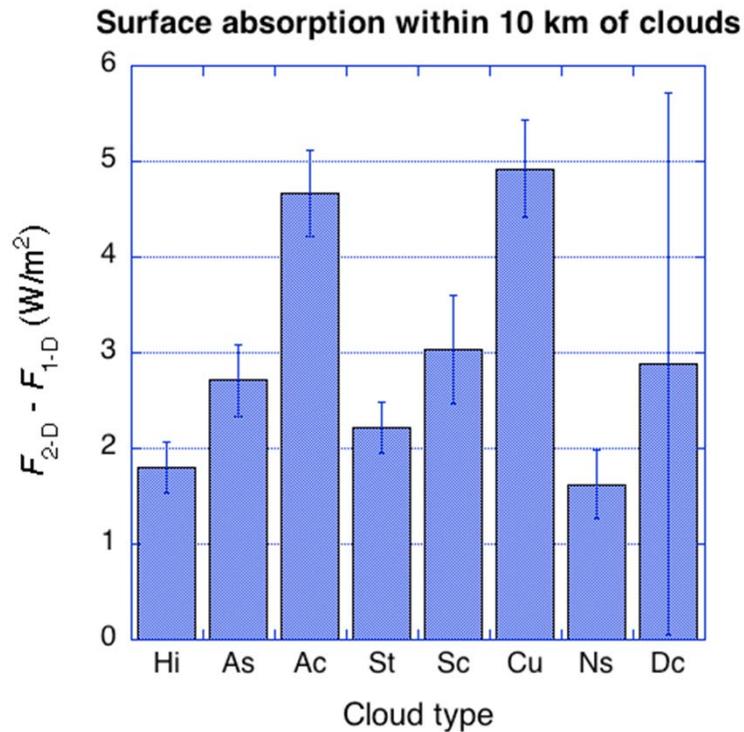
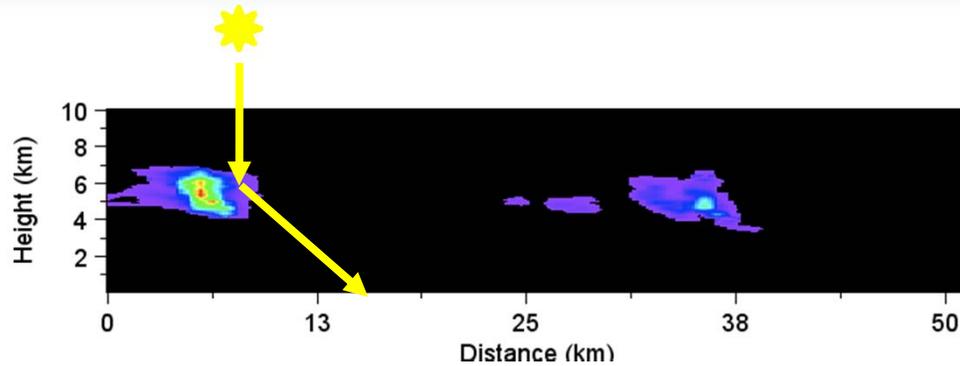
Stochastic cloud modeling for studies of cloudy-clear transition zones

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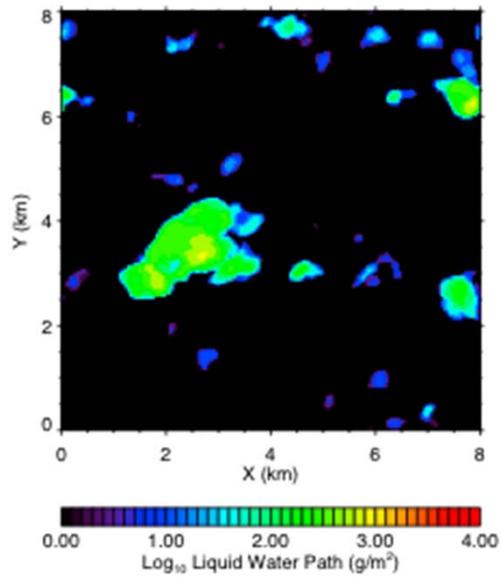


3D nature of radiative processes is important near Cu

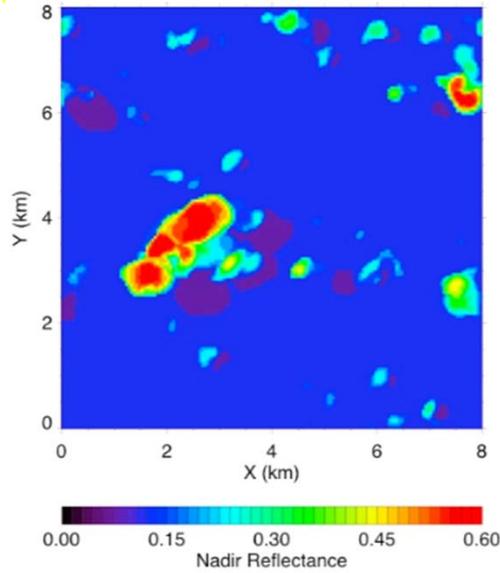


3D processes enhance radiances in transition zone

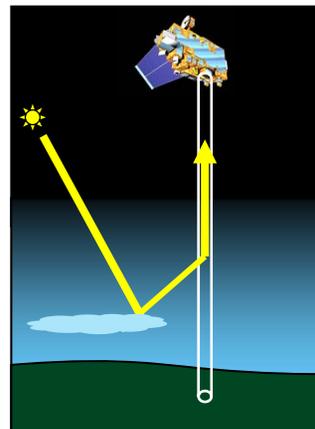
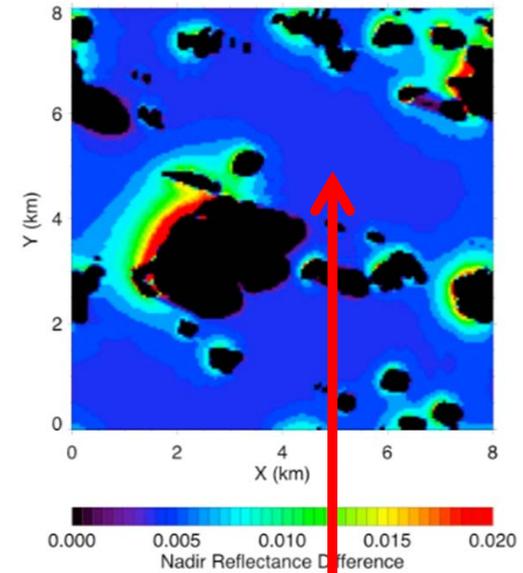
LES liquid water path



 R_{3D} (0.47 μm)



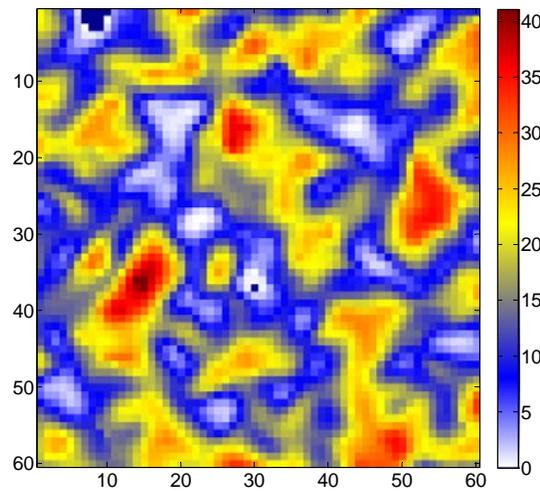
$R_{3D}-R_{1D}$ (0.47 μm)



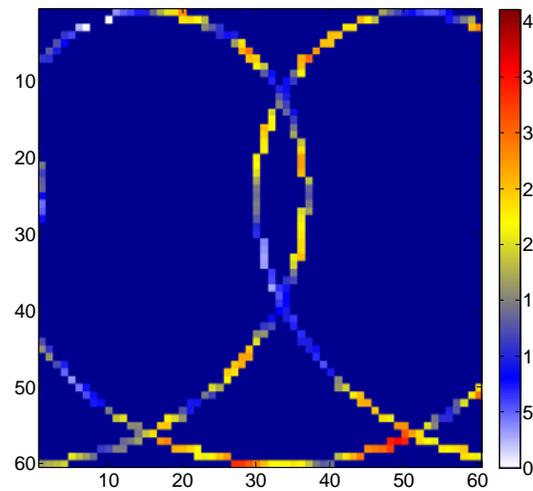
3D effect:
enhancement
everywhere
(outside shadows)

Interpolation fills gaps between radar scans too smoothly

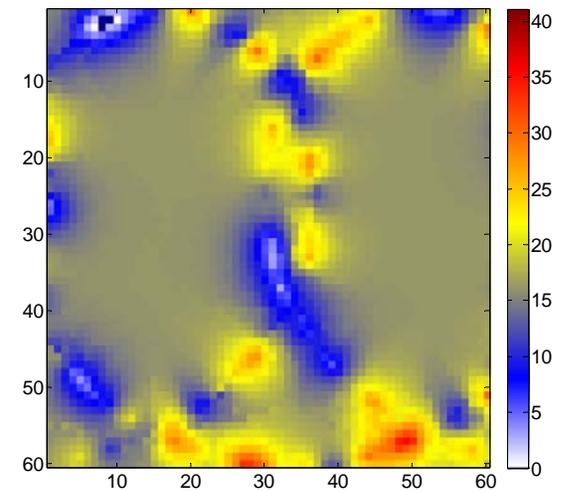
Original



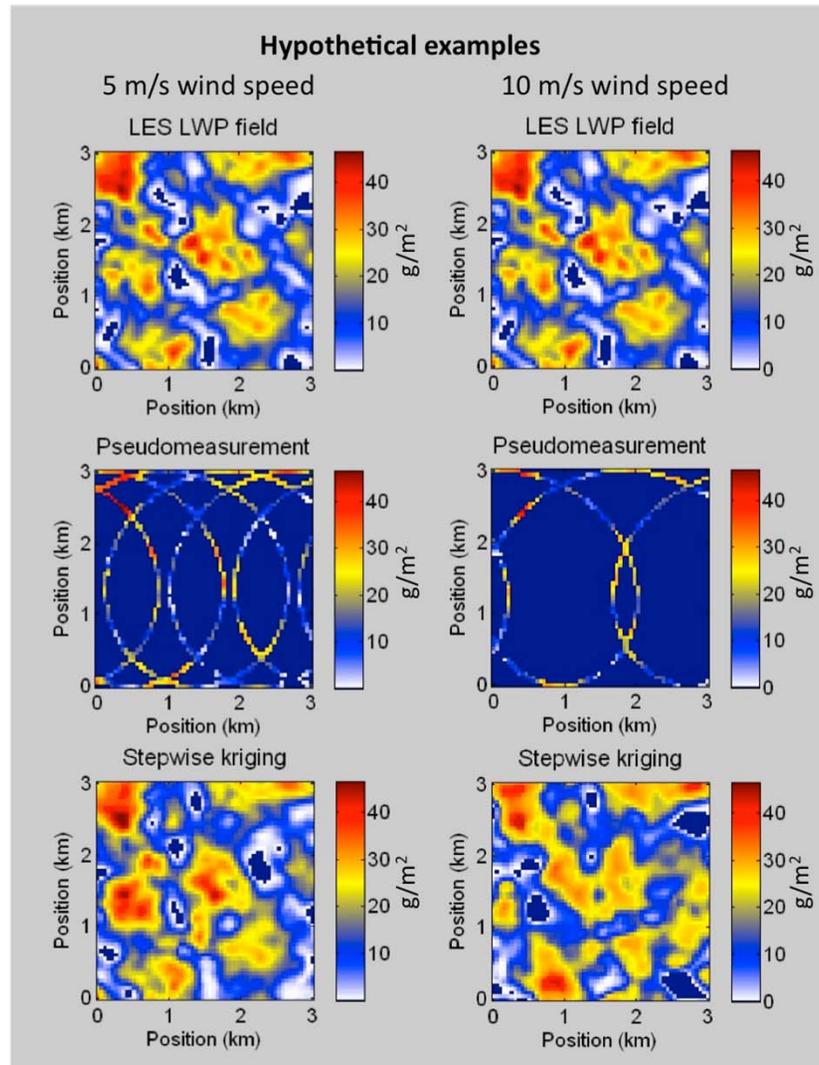
Sample



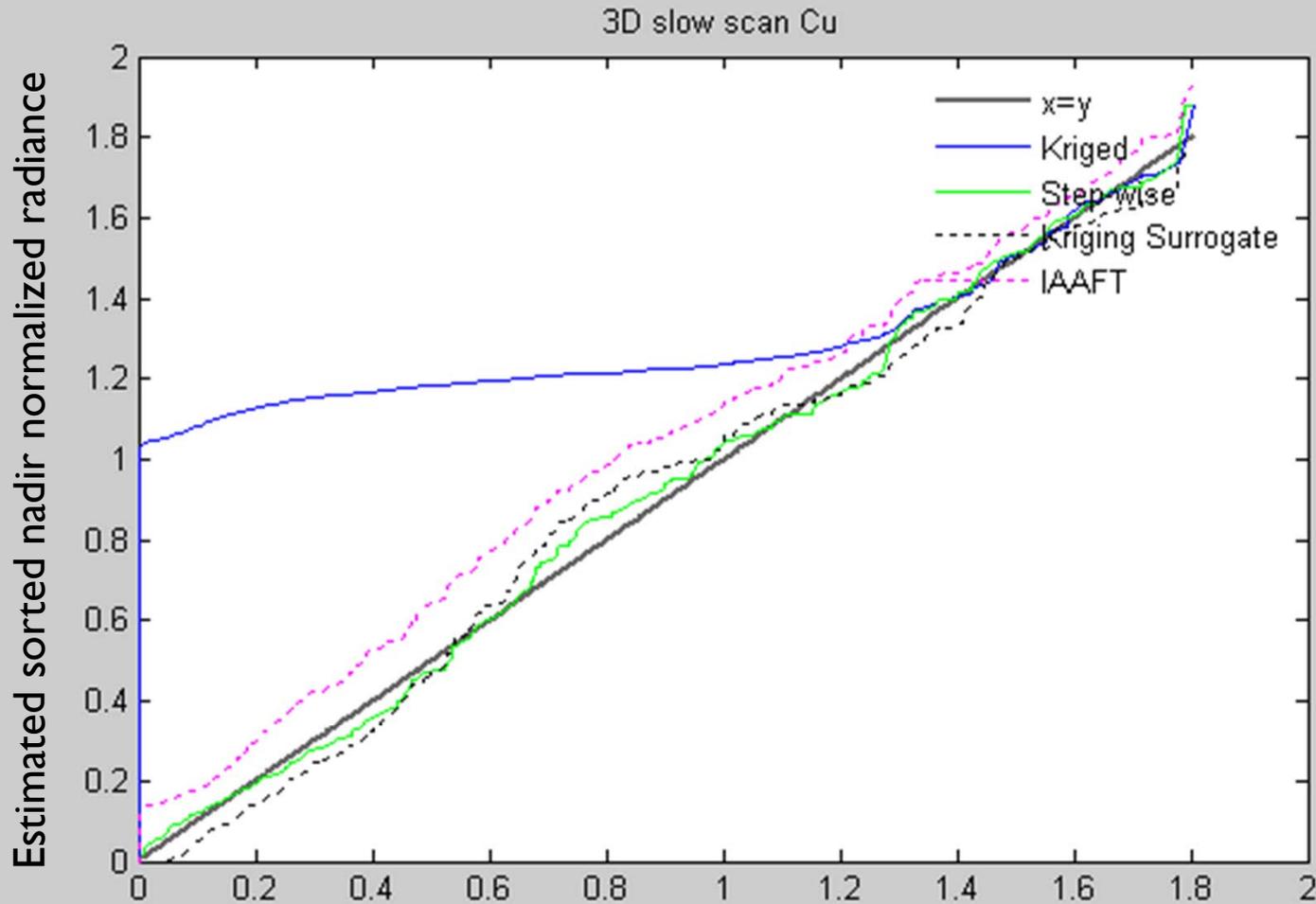
Kriged field



Stepwise kriging appears promising



Zenith radiance histogram reasonable in Cu fields



“True” sorted nadir normalized radiance from LES simulation

Summary

- Calculating radiation fields and interpreting radiation measurements in the clear-cloudy transition zone need to consider the 3D nature of radiative processes.
- 3D radiation calculations need continuous input cloud fields, and so they require filling any gaps between radar scans.
- While simple interpolation would fill the gaps too smoothly, stochastic cloud models appear promising—but they still need to be extended to 3D.

