Estimating Thick Ice Cloud Optical Depth Using Infrared Imagery

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- Retrieval of cloud tau at night limited by blackbody limit of IR emissivity
  - $\tau \sim 6$ or so
- Some information found in channel differences could be exploited for larger tau
  - try a neural network method (NN)
- Train with known input (imager) and output (CloudSat) datasets
- Apply to new input and compare to reference (CloudSat)
  - Use Aqua MODIS 2007 & 2008
Comparison of Cloud Ice Optical Depths from NN and CloudSat

(a) 2008 CloudSat, 2°x2° Mean

(b) 2008 COPIN4, 2°x2° Mean

Optical Depth

1 10 100
Using a 3-Ch nighttime NN Algorithm

- 3-channel algorithm works nearly as well as 4-channel method
  - can use with GEO data lacking 12 μm
IWP Comparison Daytime, 1 Feb 2007, 02:35 UTC

VISST

3-ch NN