ATS/CIRA Colloquium

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Visiting ATS from the University of Michigan

Spectrum: An Underutilized Dimension
in Climate Observations and Modeling

Hosted by Christine Chiu

Friday, Sept. 21, 2018

ATS room 101
Discussion will begin at 11:15 a.m.
Refreshments will be served at 10:45 a.m. in the weather lab

While broadband flux has been widely used in climate studies, its integrand, the spectral flux, has not been fully utilized in climate studies. An important trait of spectral diagnostics is that they can reveal compensating biases, which cannot be revealed by broadband diagnostics alone. I will first describe an algorithm developed in my group to derive such spectral flux from currently available satellite observations over the entire longwave spectrum. Four GCMs are used to illustrate the application of the spectral flux and cloud radiative effects in model evaluations. Next, I will describe the longwave spectral radiative feedbacks as derived from the CMIP3 and CMIP5 archives using a spectral radiative kernel technique, as well as the spectral decomposition of longwave cloud radiative feedback from the A-Train observations and the CESM simulation. Last, I will briefly describe a study of incorporating surface spectral emissivity into the climate model, the motivation, the procedure, and the impact on the simulated climate mean state as well as climate changes. If time allows, I will briefly mention two ongoing satellite missions that I participate in, PREFIRE by NASA and FORUM by ESA, and the connections to the spectral studies described above.

Link to colloquia page: https://www.atmos.colostate.edu/colloquia/