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# JOURNAL CLUB

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## Observations of Instability Layers in the Mesosphere and Lower Thermosphere using Rocket Chemical Tracers and Lidars

by

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### ABSTRACT

Several recent experiments have combined sounding rocket instrument and chemical tracer measurements with ground-based lidar and radar measurements to study instability layers in the mesosphere and lower thermosphere. Notable examples are the Coqui 2 sounding rocket campaign in Puerto Rico (Feb/Mar 1998) and TOMEX (Oct 2000) which was carried out at White Sands Missile Range in New Mexico. The observations from those experiments show the presence of convective and dynamical instabilities of the Kelvin-Helmholtz type but in addition also show the presence of what appears to be convective roll instabilities at the mesopause. The latter instability is a well known phenomenon in the planetary boundary layer which improvements in instrumentation over the last decade have shown to be ubiquitous and an important component in the overall dynamics of the lowest 1-2 km of the atmosphere. The presence of such instabilities near the mesopause is unexpected but perhaps not surprising since similar static stability and background wind shear conditions exist in both atmospheric regions. The observational evidence will be described and the implications of the existence of those, as well as the convective and Kelvin-Helmholtz dynamical instabilities, will be discussed.

Friday, March 14, 2003  
Globe Room, Elvey Bldg.  
3:45 pm