

ATS/CIRA Colloquium

Prof. Volkmar Wirth

Visiting CSU ATS from the University of Mainz, Germany

Long-lived Rossby wave trains as precursors to strong winter cyclones over Europe

Hosted by Thomas Birner

Tuesday, September 25, 2012

**ATS room 101; Discussion will begin at 3:30pm
Refreshments will be served at 3:00pm in the coffee lounge**

The statistical connection between strong surface cyclones over Europe and long-lived upper-tropospheric Rossby wave trains is examined for the Northern Hemisphere winter season using 45 years of reanalysis data. Dates are selected for which the surface pressure anomaly over Central Europe is below a threshold yielding the 5%-percentile of the lowest values. Composites of upper tropospheric meridional wind for these dates (including a lead or lag in time) display clear signs of a wave train. The composite wave train lives for over two weeks and propagates eastward over more than 360 degrees longitude. The phase speed of individual lows and highs, by contrast, is almost stationary, and the same is true for the composite surface low. There is a pronounced northward shift of the wave train as it propagates over the North American East coast. Although this composite wave train is statistically highly significant, there is large scatter about the mean. An index is defined which quantifies the similarity of the upper-tropospheric meridional wind pattern for an arbitrary date with the composite wave train for a certain lead or lag. Given large positive values of the index, there is an enhanced probability for a strong surface cyclone over Central Europe a few days later. Comparison with a previous study focusing on Pacific cyclones shows noteworthy differences

Link to colloquium videos and announcement page: <http://www.atmos.colostate.edu/dept/colloquia.php>