

# CGD SEMINAR



**DATE:** Monday, 28 January 2019

**TIME:** 11 a.m.

**LOCATION:** NCAR, 1850 Table Mesa Drive  
Mesa Lab, Main Seminar Room

**TITLE:** Estimating Scale-Dependent Temporal  
Variability

**SPEAKER:** Nedjeljka Žagar, University of Ljubljana

## ABSTRACT:

I will present a method for the scale distribution of global circulation variability in weather or climate models in comparison with reanalysis data. The method application to the low resolution, monthly ERA-20C reanalysis fields provides the interannual variability spectrum with around one-quarter of the meridionally and vertically integrated global variability in the zonal mean state. The smaller the scale, the less variability and in scales with the zonal wavenumber greater than 10 there is only about 10% of the total interannual variability. Similarly, the method application to the ERA-Interim daily data quantifies decreasing subseasonal variability for larger zonal wavenumbers. Time series of subseasonal variability anomalies in ERA-Interim show an increase in variability after year 2000, likely reflecting the observed increase in the tropical precipitation variability.

The interannual variability spectrum of ERA-20C is used to validate a general circulation model at the same horizontal and vertical resolution. The results quantify the underestimation of interannual variability in the model at all scales, but especially at largest scales. The scale distribution of normalized cumulative interannual variability for each season and annual mean is about the same as in the reanalysis, suggesting it is a climate system property. Deficiencies in model temporal variability are accompanied by deficiencies in its spatial variability in the same wavenumbers and by a poor representation of the model annual cycle of energy in planetary-scale waves. This may not be surprising for a model tuned to reproduce well the annual average precipitation and surface temperature fields.

**Live webcast:** <http://ucarconnect.ucar.edu/live>

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