

## Comparing models?

### How can we compare models?

- Means
- Variance
- EOFs match
- Fourier spectra match  
(Phase and amplitude)
- Other ways?

## T-test

- Need to test of difference are bigger than the variance. (i.e., they are significant)

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\left[ \frac{\sum(x_1 - \bar{x}_1)^2 + \sum(x_2 - \bar{x}_2)^2}{n_1 + n_2 - 2} \right] \left[ \frac{1}{n_1} + \frac{1}{n_2} \right]}}$$

## Assignment

### *Are two models difference?*

- Read in data from two sources  
(from netcdf, as per last week)
- Compare two models:
- Create map of means
- Create map of difference in mean
- Create map of variance
- Create map of “t” value
- Deduce statistical significant?
- Explain your results on the wiki.
  - Try IDL’s functions: “mean”, and “variance”

# Datasets

See NetCDF files in  
/home/atoc/faculty/dcn/ATOC7500/week13  
cammonthly.nc cammonthly-2.nc ncepmonthly.nc

*These are the same NetCDF format as last week.*

Limit your study to a simple question:

- Is January temperature different from February?
  - Is July water vapour of model1 different from model2
  - Is the annual mean wind speed in model 1 different from NCEP
- 
- Remember to report your findings to the wiki
  - Also, use this opportunity to see how well NCAR's CAM works!
  - Think of ways to compare models results in your projects

# Presentations

- 15 minutes
- Should outline your science goal
- Describe the theory behind the model you are building/have build
- Present (preliminary) results
- Discuss issues/problems,/etc. with model
- Discuss possibly limitations of science results/possible uncertainties
- Discuss next steps (for this project, and what would come as an ideal next step)

## **Tuesday**

Chuck  
Derek  
Nik  
Tianyi

## **Tuesday**

Dave  
Annie  
Jason  
Matt S

## **Thursday**

Darren  
Elizabeth  
Scott  
Matthew H  
Lansing

## **Thursday**

Lin  
Xylina  
Group report  
(model overview and  
climatology validation)

*Please organize a swap if need be*

(Next week will be more “work in progress”, the second week will be “almost final” results)

## Note on grading

- 30% midterm, 50% final, 20% labs
- 20% labs means contributions to the wiki
- The project will be graded on science. The modeling is part of this (i.e., the task is to “build a model”, but your report should have a science feel (numerical methods are science))
- Remember to make clear what YOUR contribution is.