

AMS 245 – Homework Assignment #1  
due Friday, April 13

1. For each of the following powers and ranges (scales):

| power | range |
|-------|-------|
| 2     | 2     |
| 2     | 4     |
| 2     | 8     |
| 1.8   | 4     |
| 1.6   | 4     |
| 1.6   | 8     |
| 1.3   | 4     |
| 1     | 4     |
| 1     | 8     |
| 1     | 12    |
| 0.5   | 8     |

- (a) Generate several random realizations  
(b) Plot the theoretical (semi)variogram against the empirical (semi)variogram for each surface

Summarize your findings. Also, include exactly one of the variogram plots (not more), and comment on whether that one is a typical result or a highly unusual result.

2. By trial and error, create a surface with a Gaussian correlation and a surface with an exponential correlation (presumably with different range parameters) such that the two surfaces look similar in smoothness. Plot the surfaces side-by-side. Also plot the two theoretical (semi)variograms (on the same plot) and the two empirical variograms (on the same plot, but perhaps a different plot from the theoretical one).