

Lab 3 Assignment

1. Plot data and conduct an autocorrelation analysis of the Greenland ice core $\delta^{18}\text{O}$ data and identify the time lags (if any) that exhibit a statistically significant correlation with this time series at or above the $p = 0.95$ level.
2. Plot data and conduct an Fourier analysis of the Green River varve thickness data. Identify frequencies (if any) that exhibit a statistically significant power at or above the $p = 0.99$ level.
3. Plot data and statistically test the hypotheses that the distribution of well locations recorded in the Sample Localities dataset conform to the following distributions
 - uniform
 - random

Accept the null hypothesis for these comparisons if there is a 97.5% probability they are true.

4. Plot data and statistically test for mean directional differences in the the three Midland Basin (Odessa) well field fracture patterns. Accept the null hypotheses is there is a 90% probability of it being true.
5. Plot data and present a graphic analysis of the stratigraphic correlation between the Morgan Creek and James River sections of Palmer's (1954) Texas trilobite data (Palmer Riley Data (MC & JR).txt). Based on your results give positions and relative durations of any implied missing time intervals in both sections.
6. Use the CONOP routine to construct composite stratigraphic ranges for 26 Cambrian taxa occurring in 7 Riley Formation sections collected by Palmer (1954). Use this result to construct a biodiversity history for these data over the interval.