

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Finding hidden periodic signals in time series – an application to stock prices MICHAEL O'SHEA, Kansas State Univ — Data in the form of time series appear in many areas of science. In cases where the periodicity is apparent and the only other contribution to the time series is stochastic in origin, the data can be 'folded' to improve signal to noise and this has been done for light curves of variable stars with the folding resulting in a cleaner light curve signal. Stock index prices versus time are classic examples of time series. Repeating patterns have been claimed by many workers and include unusually large returns on small-cap stocks during the month of January, and small returns on the Dow Jones Industrial average (DJIA) in the months June through September compared to the rest of the year. Such observations imply that these prices have a periodic component. We investigate this for the DJIA. If such a component exists it is hidden in a large non-periodic variation and a large stochastic variation. We show how to extract this periodic component and for the first time reveal its yearly (averaged) shape. This periodic component leads directly to the 'Sell in May and buy at Halloween' adage. We also drill down and show that this yearly variation emerges from approximately half of the underlying stocks making up the DJIA index.

Michael O'Shea
Kansas State Univ

Date submitted: 15 Nov 2013

Electronic form version 1.4