Abstract Submitted
for the APR12 Meeting of
The American Physical Society

Maximum entropy Fourier power spectrum for irregularly sampled data[1] ROBERT JOHNSON, Alphawave Research, Atlanta, GA 30238 — The principle of maximum entropy is applied to the spectral analysis of a data signal with general covariance matrix and containing gaps in the record. The role of the entropic regularizer is to prevent one from overestimating structure in the spectrum when faced with imperfect data. Several arguments are presented suggesting that the arbitrary prefactor should not be introduced to the entropy term. The introduction of that factor is not required when a continuous Poisson distribution is used for the amplitude coefficients. The result of including the entropic measure factor is to suggest a spectrum consistent with the variance of the data which has less structure than that given by the forward transform, thus providing a more conservative estimate in light of experimental noise. An application of the methodology to example data derived from stellar observations is demonstrated.

[1]R. W. Johnson (2011), Astrophys. Space Sci., DOI 10.1007/s10509-011-0922-4.

Robert Johnson
Alphawave Research, Atlanta, GA 30238

Date submitted: 10 Jan 2012 Electronic form version 1.4