

## **The autocorrelation function of Cyg X-1**

Thomas J. Maccarone (Yale University), Paolo Coppi (Yale University)

The shot noise variability of Cygnus X-1 has been studied extensively with frequency domain methods in recent years, but very little has been done using time domain analysis methods. To complement previous work, we compute the autocorrelation function of Cygnus X-1 in the low/hard state in 6 different energy bands with 12 observations from RXTE. We note most especially that the width of the autocorrelation function becomes smaller at lower energies, thus ruling out simple Comptonization models. We compare to simulations of the extended atmosphere model and show that it produces an autocorrelation which is wider at higher energies. We discuss the implications of these results for other models for the variability of Cygnus X-1.