

Abstract Submitted  
for the MAR17 Meeting of  
The American Physical Society

**Relaxation in a two-body Fermi-Pasta-Ulam system in the canonical ensemble** SURAJIT SEN, TYLER BARRETT, SUNY Buffalo — The study of the dynamics of the Fermi-Pasta-Ulam (FPU) chain remains a challenging problem. Inspired by the recent work of Onorato et al. (PNAS 112, 4208 (2015)) on thermalization in the FPU system, we report a study of relaxation processes in a two-body FPU system in the canonical ensemble. The studies have been carried out using the Recurrence Relations Method introduced by Zwanzig, Mori, Lee and others. We have obtained exact analytical expressions for the first thirteen levels of the continued fraction representation of the Laplace transformed velocity autocorrelation function of the system. Using simple and reasonable extrapolation schemes and known limits we are able to estimate the relaxation behavior of the oscillators in the two-body FPU system and recover the expected behavior in the harmonic limit. Generalizations of the calculations to larger systems will be discussed.

Tyler Barrett  
SUNY Buffalo

Date submitted: 19 Jan 2017

Electronic form version 1.4