Abstract Submitted
for the NEF15 Meeting of
The American Physical Society

Inflation and the Measurement Problem[1] DHRUBO JYOTI, STEPHON ALEXANDER, Dartmouth College, JOAO MAGUEIJO, Imperial College, London, UK — Inflation is a very successful paradigm in cosmology, solving the Horizon, Flatness and Monopole problems with the Hot Big Bang theory. But perhaps its biggest selling point is that, it provides an elegant, quantum mechanical origin of large scale structure. [Starobinski, 1980; Guth and Pi, 1982] However, while this description of the emergence of primordial structure from quantum zero-point fluctuations of the inflaton field has been studied in detail for decades [Prokopec 1994; Polarski and Starobinski 1996; Kiefer et al. 2007], a number of prominent authors acknowledge important gaps in our understanding of the mechanism [Weinberg, "Primordial Cosmology"; Lyth and Liddle, "The Primordial Density Perturbations"; Padmanabhan, "Cosmology" CUP]. (For a review, see [Sudarsky et al 2006]) Even some of the leading proponents of the theory concede that the current description, the so-called quantum-to-classical transition, is only "pragmatic" and needs eventually to be fully justified [Kiefer and Polarski 2009]. In our upcoming paper [Alexander, Jyoti and Magueijo, to appear], we discuss and define this cosmological quantum measurement problem, and propose a solution. Our work is similar in spirit to that of [Martin, Vennin, Peter 2012; Canate, Pearle, Sudarsky 2013], except that we propose an effective collapse mechanism arising from interaction of Fourier modes, rather than a fundamental modification to the Schrodinger equation.

[1]Inflation and the Measurement Problem

Dhrubo Jyoti
Dartmouth College

Date submitted: 19 Oct 2015 Electronic form version 1.4