Preferential Excitation of Stellar Oscillations of a Magnetar with a Tangled Magnetic Field

JOSEPH BRETZ, ANTHONY VAN EYSDEN, BENNETT LINK, Montana State University — Magnetars are strongly magnetized ($\sim 10^{15}$ Gauss) neutron stars. Some of them produce giant flares that exhibit quasi-periodic oscillations which have been attributed to stellar oscillations that modulate the emission. A tangled magnetic field model introduces a spectrum of magnetic normal modes that can explain the observed quasi-periodic oscillations, as expected from stability considerations. We show that reasonable initial conditions preferentially excite stellar oscillations, and find promising agreement with data.

\textsuperscript{1}Funding support from Montana Space Grant Apprenticeship Program

Joseph Bretz
Montana State University

Date submitted: 30 Sep 2016