Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Switching Experiments on a Current-Biased MgB_2 Josephson Junction[1] ROBERTO RAMOS, JEROME MLACK, JOSEPH LAMBERT, STEVEN CARABELLO, Department of Physics, Drexel University — As the current through a Josephson junction is increased, the voltage across the junction switches from zero to a finite voltage. This is analogous to the escape of a phase particle originally oscillating with a plasma frequency ω in a washboard potential well, to the running state. We report results of our switching experiments on current-biased MgB_2/I/Pb thin film junctions through a broad range of sub-Kelvin temperatures. Our results exhibit features in the escape rate Γ suggestive of substructure within the pi gap of MgB_2, which is consistent with our recent work demonstrating substructure within the pi and sigma superconducting energy gaps of MgB_2. Upon irradiation of microwaves with frequencies resonant with the plasma frequency, we observe enhancement of escape rates, which is a clear demonstration of microwave resonant activation in these devices. By manipulating frequency and power, we demonstrate good control over the escape of the phase particle.

[1]We wish to thank Profs. Xiaoxing Xi and Ke Chen for providing high-quality MgB_2 Josephson junctions.

Roberto Ramos
Department of Physics, Drexel University

Date submitted: 19 Nov 2010 Electronic form version 1.4