

Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Experiment to Study Alfvén Wave Propagation in Plasma Loops¹

MARK KENDALL, PAUL BELLAN, California Institute of Technology — Solar coronal loops are simulated in the laboratory using pulsed power techniques [1]. We are now developing a method to excite propagating Alfvén wave modes by superposing a current pulse of roughly 10kA and width 100ns upon the ~50kA, 10 microsecond main discharge current that flows along the ~10cm long, 1cm diameter arched flux tube. To achieve this short 100ns pulsed timescale at such high power, a magnetic pulse compression technique based on saturable reactors will be employed. A low power prototype has been successfully tested, and design and construction of a full-power device is underway. Upon completion, the fast current pulse device will be used to investigate interactions between the Alfvén waves and the larger-scale loop evolution. Particular attention will be paid to wave propagation including dispersion and reflection, as well as dissipation mechanisms and possible energetic particle generation.

[1] J. F. Hansen, S. K. P. Tripathi, P. M. Bellan, “Co- and Counter-helicity Interaction Between Two Adjacent Laboratory Prominences,” *Phys. Plasmas*, vol. 11, issue 6, p. 3177 (2004)

¹Research supported by NSF, AFOSR, DOE.

Mark Kendall
California Institute of Technology

Date submitted: 17 Jul 2009

Electronic form version 1.4