

Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

A 3D high-speed probe for measuring the magnetic components of a whistler wave PAKORN WONGWAITAYAKORNKUL¹, Rice University, XIANG ZHAI, PAUL M. BELLAN, California Institute of Technology — In the Caltech astrophysical jet experiment, observations show that a burst of wave activity in the whistler frequency regime (10-30 MHz) occurs at the time of a fast magnetic reconnection. The whistler wave magnetic component is expected to be circularly polarized even for oblique propagation and also contains most of the energy.² An inductive whistler wave detector has been designed using B-dot probes to measure the 3D high frequency magnetic field fluctuation. Each probe component consists of two miniature commercial oppositely oriented inductor coils connected to a miniature transformer. The transformer subtracts the signals of the two coils to cancel the unwanted capacitive component and retain the inductive component. The three coil pairs are arranged orthogonally and are adjacent to each other. The probe has excellent rejection of capacitive coupling and should resolve the whistler wave polarization. The measurements will be compared with other diagnostics, namely a capacitively coupled probe, an ultra-high-speed camera and a EUV detector.

¹Summer Undergraduate Research Fellow at Caltech

²Bellan, P. M. (2013) *Circular polarization of obliquely propagating whistler wave magnetic field* (submitted for publication).

Pakorn Wongwaitayakornkul
Rice University

Date submitted: 09 Jul 2013

Electronic form version 1.4