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New X-Ray Detector for Caltech Plasma Jet Experiment RYAN MARSHALL, PAUL BELLAN, Caltech — Magnetic reconnection is a process that occurs in plasmas where magnetic field lines break and re-attach to form a different topology having lower energy. Since the magnetic field is changing very fast in the reconnection region, Faraday's Law states that there is a large electric field that accelerates electrons which can then create x-rays. X-rays have been previously observed in the Caltech plasma jet experiment and in similar experiments. We have assembled a new detector consisting of a scintillator that is more than 10 times the volume of the previous one and a light guide that allows the photomultiplier tube to be 2 meters from the experiment so that electrical noise is reduced. The setup has been tested using a weak natural Thorium source and will soon be mounted on the Caltech jet experiment in front of a kapton vacuum window that allows x-rays to pass. Kapton has good transmission above 5 KeV.

Ryan Marshall
Caltech

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