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Hard X-Ray Burst Detected From Caltech Plasma Jet Experiment Magnetic Reconnection Event RYAN S. MARSHALL, PAUL M. BELLAN, Caltech — In the Caltech plasma jet experiment a 100 kA MHD driven jet becomes kink unstable leading to a Rayleigh-Taylor instability that quickly causes a magnetic reconnection event. Movies show that the Rayleigh-Taylor instability is simultaneous with voltage spikes across the electrodes that provide the current that drives the jet. Hard x-rays between 4 keV and 9 keV have now been observed using an x-ray scintillator detector mounted just outside of a kapton window on the vacuum chamber. Preliminary results indicate that the timing of the x-ray burst coincides with a voltage spike on the electrodes occurring in association with the Rayleigh-Taylor event. The x-ray signal accompanies the voltage spike and Rayleigh-Taylor event in approximately 50% of the shots. A possible explanation for why the x-ray signal is sometimes missing is that the magnetic reconnection event may be localized to a specific region of the plasma outside the line of sight of the scintillator. The x-ray signal has also been seen accompanying the voltage spike when no Rayleigh-Taylor is observed. This may be due to the interframe timing on the camera being longer than the very short duration of the Rayleigh-Taylor instability.

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