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**Experimental investigation of impulsive magnetic reconnection induced by large amplitude electromagnetic fluctuations in the presence of a guide field** AKIHIRO KUWAHATA, MICHIAKI INOMOTO, RYOMA YANAI, YASUSHI ONO, The University of Tokyo — Impulsive enhancement of magnetic reconnection is one of the potential candidates to invoke various explosive events observed in nature and laboratory plasmas. In TS-3 laboratory experiment with a guide field of  $B_{guide}/B_{rec} = 1-2.5$ , impulsive growth of the reconnection electric field was observed just behind the onset of large-amplitude electromagnetic fluctuations ( $f = 1.5-2 f_{ci}$  and the amplitude was  $0.1B_{rec}$ ). It was found that both the fluctuation amplitude and the enhanced reconnection electric field during the fluctuation period showed positive correlation with the guide field. The normalized reconnection rate of about 0.03 before the onset of fluctuations was reasonably comparable with the classical reconnection rate of Sweet-Parker model. However, the reconnection rate rose up to 0.11 after the fluctuations onset, suggesting that the transition from slow steady reconnection to fast impulsive reconnection took place. Since the fluctuation amplitude was so large that the nonlinear terms of the induced electric field was not negligible. The electric field enhancement due to the nonlinear contribution from the observed fluctuation was 650 V/m, which showed good agreement with the experimentally observed electric field increment of about 800 V/m.

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