Abstract Submitted
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Generation of the lower-hybrid wave inside a reconnecting current sheet in space and laboratory[1] JONGSOO YOO, Princeton Plasma Physics Laboratory, S. WANG, NASA Goddard Space Flight Center, M. AMBAT, University of California, Berkeley, H. JI, Princeton University, J. JARA-ALMONTE, Princeton Plasma Physics Laboratory, L.-J. CHEN, NASA Goddard Space Flight Center, M. YAMADA, W. FOX, S. BOSE, A. ALT, A. GOODMAN, Princeton Plasma Physics Laboratory — Lower hybrid waves during magnetic reconnection with a guide field are studied with data from the Magnetospheric Multiscale (MMS) mission and the Magnetic Reconnection Experiment (MRX). The observed lower hybrid wave (LHW) propagates almost perpendicular to the magnetic field and is capable of inducing fluctuations in the electric and magnetic fields as well as density. A simple theoretical model has been developed to explain the excitation of the LHW, which shows that the high perpendicular electron current is the free energy source for the wave. The guide field is also required to keep the electron beta lower than the unity inside the current sheet. The parallel electron current affects the frequency of the most unstable mode. A magnetotail event and MRX data show that this wave exists in the electron diffusion region, possibly affecting the reconnection dynamics.

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Jongsoo Yoo
Princeton Plasma Physics Laboratory

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