

Abstract Submitted
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In situ evidence of new magnetotail reconnection regime with embedded current layers and anisotropic exhaust electrons¹ JOHN BOGUSKI, JAN EGEDAL, UW-Madison, WILLIAM DAUGHTON, LANL — Using kinetic simulations a new regime of magnetic reconnection has been discovered in parameter ranges similar to those found in the Earth's magnetotail [1]. The regime is closely related to the dynamics of magnetized trapped electrons causing strong electron pressure anisotropy which reaches the firehose condition and has the ability to drive current layers in the reconnection exhaust [2]. As part of an endeavor to conclusively verify the existence of the new reconnection regime in Earth's magnetotail, a systematic analysis of the 2002-08-28 reconnection event first identified by A.L. Borg [3] is performed. In particular we assess the pressure anisotropy, the satisfaction of the firehose condition, and the agreement of pressure measurements to those predicted from theory. The analysis of this event and comparison to simulation results document the importance of the new regime to reconnection in the Earth magnetosphere.

[1] A. Le et al., PRL 110, 135004, 2013.

[2] A. Le et al., PRL 102, 085001, 2009.

[3] A.L. Borg et al., Annales Geophysicae, 30(1):109-117, 2012.

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