

Abstract Submitted  
for the DPP17 Meeting of  
The American Physical Society

**How Alfvén waves set the large scale structure of magnetic reconnection.**<sup>1</sup> HARSHA GURRAM, JAN EGEDAL, Univ of Wisconsin, Madison — A PIC simulation of anti-parallel reconnection shows the formation of the out-of-plane or Hall magnetic field that extends hundreds of inertial lengths from the X-line. This structure is generated by field-aligned electron currents that flow outside the magnetic separatrices when ion and electrons decouple on length scales less than  $d_i$ . We observe that this Hall field propagates from the X-point to far downstream into the exhaust along the magnetic field lines at Alfvénic speed. Thus the propagation of this large scale reconnection structure can be associated with a Alfvén wave generated in the inner electron diffusion region, specifically near the X-line.

<sup>1</sup>This work was supported by NSF Award 1404166 and NASA award NNX15AJ73G.

Harsha Gurram  
Univ of Wisconsin, Madison

Date submitted: 14 Jul 2017

Electronic form version 1.4