How Alfvén waves set the large scale structure of magnetic reconnection.\textsuperscript{1} 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.

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