

## Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: **Movement of the field lines during asymmetric reconnection in MRX.** Color contours on the  $X$ - $Z$  plane show the profile of the out-of-plane magnetic field in Fig. 1(b). The blue lines represent the field lines measured by a 2D magnetic probe array. The field lines move from both the high-density (upper) side and low-density (lower) side toward the center of the reconnection layer ( $X$ -line) where field lines break, reconnect, move away from the  $X$ -line. Due to the asymmetry in magnetic field profile, the plane where the field lines move on the high-density side is tilted significantly with respect to the  $Y$  axis.