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Supporting Information for

Jupiter's Double-arc Aurora as a Signature of Magnetic Reconnection: Simultaneous Observations from HST and Juno

R. L. Guo[1,2], Z. H. Yao[3]*, D. Grodent[1], B. Bonfond[1], G. Clark[4], W. R. Dunn[5], B. Palmaerts[1], B. H. Mauk[4], M. F. Vogt[6], Q. Q. Shi[2], Y. Wei[3], J. E. P. Connerney[7,8], and S. J. Bolton[9]

[1]Laboratory for Planetary and Atmospheric Physics, STAR institute, Université de Liège, Liège, Belgium.

[2]Laboratory of Optical Astronomy and Solar-Terrestrial Environment, Institute of Space Sciences, School of Space Science and Physics, Shandong University, Weihai, Shandong, China.

[3]Key Laboratory of Earth and Planetary Physics, Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, China.

[4]Applied Physics Laboratory, Johns Hopkins University, Laurel, MD, USA.

[5]UCL Mullard Space Science Laboratory, Dorking, UK.

[6]Center for Space Physics, Boston University, Boston, MA, USA.

[7]Space Research Corporation, Annapolis, MD, USA.

[8]NASA Goddard Space Flight Center, Greenbelt, MD, USA.

[9]Southwest Research Institute, San Antonio, TX, USA.

Corresponding author: Zhonghua Yao (z.yao@ucl.ac.uk)

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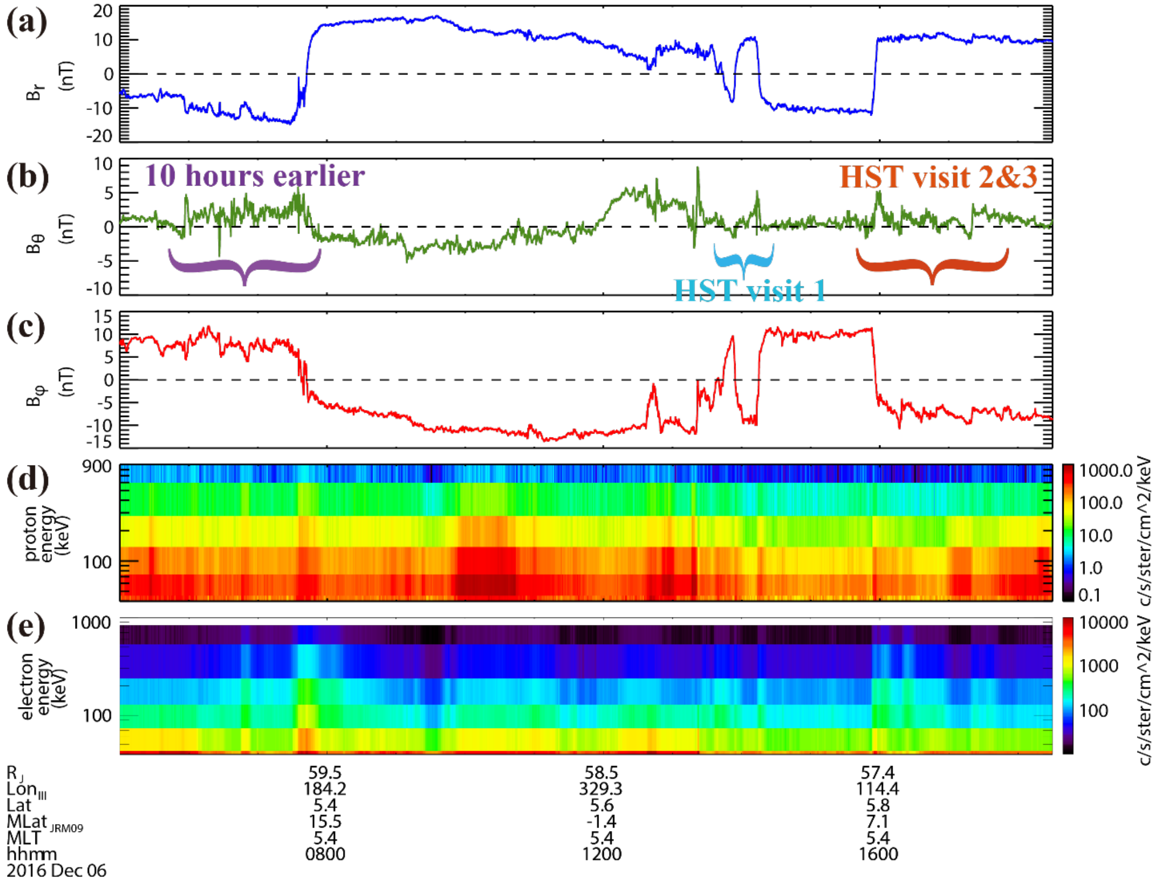

Figure S1. The magnetic field and energetic charged particles in the magnetosphere observed by the Juno spacecraft. (a-c) Three components of the magnetic field in the RTP (Radial-Theta-Phi) spherical coordinates. (d-e) The ion and electron flux spectrum. Magnetic reconnection took place ~10 hours before the double-arc event recorded by HST visit 2.

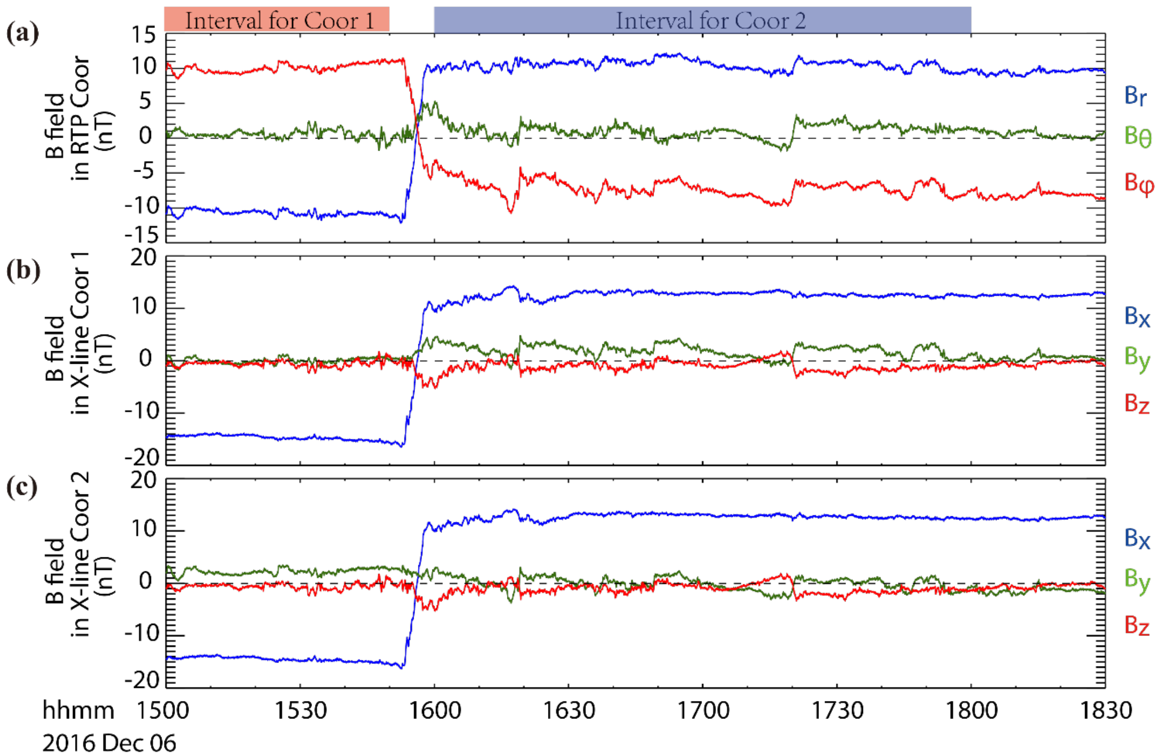

Figure S2. The magnetic field in different coordinates. Three components of the magnetic field in (a) the RTP (Radial-Theta-Phi) spherical coordinates, and (b-c) the X-line coordinates using interval from (b) 15:00 - 15:50 UT and (c) 16:00 – 18:00 UT to remove the bend-back effect. The correlation between Bz and By after the current crossing is similar in panels (b) and (c). Comparing to panel (b), the variation of By at current crossing is not evident in the panel (c), which because that: in the new frame (panel c), By has an offset before current crossing; the offset is positive in the southern hemisphere (Br/Bx <0) and negative in the northern hemisphere (Br/Bx >0); the Hall magnetic field By is positive in the northern hemisphere when Bz is negative; therefore, By component seems changes not too much during the current crossing event though the bend-back effect is weakened. However, in the frame of the panel (b), the bend-back effect before the current crossing is totally removed and the By component is almost zero; the large By variation during current crossing contains both the Hall effect and the weakening of the bend-back effect.

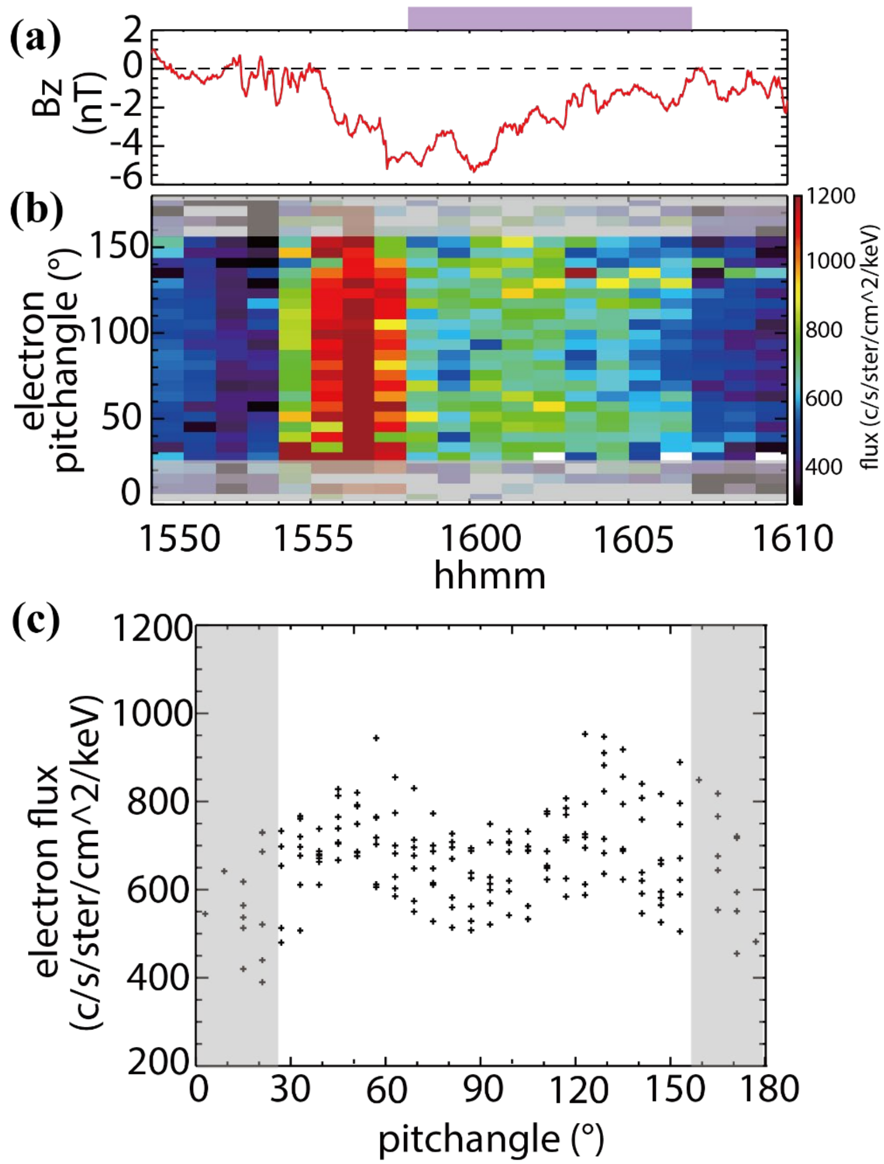

Figure S3. The pitch angle information of energetic electrons. (a) Bz component and (b) electron pitch angle spectrum around the current sheet crossing interval at ~16:00 UT. (c) Electron pitch angle distribution for the interval highlighted by the purple horizontal bar above panels (a). The gray areas in panels (b) and (c) indicate that the data counts are too low to provide reliable flux information. Although the instrument could not always provide a full pitch angle coverage from 0° to 180°, it shows that, during the interval when |Bz| was decreasing (highlighted by the purple bar above panel (a)), the 90-degree flux is lower than those with pitch angles less than 60° and greater than 120°. The distinct pitch angle profile is also clearly shown in panel (c).