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Kelvin-Helmholtz instability at the dawn flank of Saturnś magnetopause

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Evidence for the growth of the Kelvin-Helmholtz (K-H) instability at the dawn flank of Saturn's magnetopause is presented. Observations made by the Cassini spacecraft during two Saturn orbits are discussed: Rev 22 in March 2006 and Rev B in December 2004. During Rev 22 crossings of Saturn's magnetopause were made by the spacecraft on 12, 13 and 17 March 2006. Magnetic field and electron data are used to identify excursions into the magnetosheath bounded by crossings of the magnetopause current layer. Minimum variance analysis of the magnetic field vector measurements is used to determine the normal to the boundary for each crossing. The normals associated with the crossings oscillate about an average orientation that is consistent with the unperturbed normal predicted by a surface model; this reveals the presence of regular boundary waves. Based on the wave propagation directions and the typical magnetic field vectors either side of the boundary, we conclude that the waves were driven by the K-H instability. During Rev B a single magnetopause crossing was made on 13 December 2004. Using magnetic field and electron data we discuss the possibility that K-H boundary vortices were present at this time.