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Description of Saturn's Auroral Morphology During Cassini's Approach of the Magnetosphere

D. Grodent (1), J.-C. Gérard (1), S.W.H. Cowley (2), E.J. Bunce (2), J.T. Clarke (3)

(1) LPAP, Université de Liège, Belgium, (2) Dpt. of Physics & Astronomy, University of Leicester, UK, (3) CSP, Boston University, USA (d.grodent@ulg.ac.be)

The STIS camera on board HST obtained 68 FUV images of Saturn's Southern auroral emission between 8 and 30 January 2004, during Cassini's approach to Saturn's magnetosphere. The HST observations took place in four different solar wind regimes consisting of a low-field rarefaction region from 8 to 16 Jan, a 'minor' compression event on 17 Jan, a rarefaction region with intermediate field strengths from 19 to 25 Jan, and a major compression region from 26 to 30 Jan. The images have been projected onto polar maps in order to characterize and compare the general morphology of the auroral emission. The polar projections confirm dramatic changes in morphology, characterized by different average zones. During the campaign, short intervals during which the auroral region is significantly contracted and clearly forming a spiral shape were followed by intervals of re-inflation of the auroral region. It is suggested that the two major auroral contraction events corresponded to the arrival of the solar wind shocks observed by Cassini on 17 Jan and 25 Jan. The present analysis indicates that Saturn's auroral morphology responds to the solar wind conditions at Saturn.