



A multi-instrument view of Saturn's dynamic magnetosphere from the Cassini spacecraft during the February 2008 Hubble Space Telescope auroral campaign

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We discuss one complete high-latitude orbit of the Cassini spacecraft in February 2008, when the Hubble Space Telescope was observing Saturn's southern hemisphere ultraviolet auroral emissions. During this interval we find evidence for two compressions of the magnetosphere from the in situ magnetic field and electron measurements, and also from modulation of the Saturn Kilometric Radiation. Concurrently, the auroral emission region displays a range of brightness levels and spatial morphologies, some of which are clearly related to the effect of the shock compressions on the magnetosphere. Interestingly, the second forward shock in the solar wind compresses the magnetosphere to such an extent that the Cassini spacecraft enters the solar wind for some hours. Therefore we are given an unusual opportunity to sample the interplanetary magnetic field just outside Saturn's magnetosphere whilst observing a spectacular auroral "storm". This paper will discuss how features in the solar wind appear to relate to simultaneous changes in the auroral emissions.