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Particle dynamics at SLAMS observed at the bow shock of Saturn

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In this work we investigate the upstream regions of the Kronian bow shock in the vicinity of quasi-parallel shock transitions, using the plasma measurements of the Cassini spacecraft orbiting Saturn. We focus on the dynamincal processes of particle beams at Short Large Amplitude Magnetic Structures (SLAMS) which have also been investigated in the upstream region of the Earth's bow shock in recent years. SLAMS are solitary enhancements in the magnetic field upstream of the quasi-parallel regions of the planetary bow shock, where they arise from the instabilities generated by the interaction of the solar wind particles with the backstreaming ions from the shock. In this study we present the first report on observations of SLAMS at the Kronian bow shock. For our analysis we used the plasma data of the Ion Mass Spectrometer sensor of the Cassini Plasma Spectrometer (CAPS) and in order to identify the structures we also used the data of the Cassini Magnetometer. For our more thourough analysis we chose three SLAMS events from the period of 2004-2005. We examined the directional and energy distributions of the particle beams, and found signs of plasma thermalization and beam deflection at the structures. The larger upstream plasma gyroradii at Saturn imply that the characteristic length scales of the structures are larger than at the Earth. We compared the observed length scales, and plasma thermalisation characteristics with the SLAMS measurements made by the Cluster probes at Earth.