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Effects of upstream conditions on ULF waves and SLAMS formation at Saturn

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In this study we present occurrences of SLAMS (short large-amplitude magnetic structures) upstream of the quasi-parallel bow shock of Saturn. Five events are analyzed in more detail using the data of the CAPS and MAG instruments of Cassini. Directional and speed analysis of the backstreaming particles related to ULF wave formation (and subsequent SLAMS evolution) in the foreshock region is presented. We also correlate the measured the ULF wave frequencies with the variations of the upstream magnetic field.

With a simple model we estimate the distance of the observed SLAMS from the bow shock front based on the measured plasma pressure. We also discuss the spatial characteristics of SLAMS observed near Saturn.