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A detailed study of Langmuir waves observed during extended intervals of waveform captures by the Cassini Wideband Receiver in the Saturn's foreshock

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The upstream region magnetically linked to the planetary bowshock is called the foreshock. In this region energetic electrons reflected by the bowshock create beams streaming along the field lines to the solar wind flow. These electrons beams can generate electrostatic Langmuir waves via a beam instability. Langmuir waves can be identified as narrowband intense emission at a frequency very close to the local plasma frequency, usually observed close to the foreshock boundary, and weaker broadband waves below and above the plasma frequency typically observed deeper in the foreshock. A process of wave generation highly depends on beam properties. Unfortunately due to instrumental limitations, it is often difficult to identify these beams. We present a detailed study of Langmuir waves in the upstream of the Saturnian bowshock. For the detailed study we used data from the Radio and Plasma Wave Science (RWPS), Magnetometer (MAG) and Cassini Plasma Science (CAPS) instruments. We have analyzed several periods from the extended waveform captures by the Cassini Wideband Receiver. We show Langmuir waves as a bursty emission highly controlled by variations in solar wind conditions. The properties of the Langmuir wave packets along the satellite path through the foreshock are also discussed.