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Z-Mode and Langmuir wave decay in the solar wind

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With some exceptions (Krauss-Varban 1989, Malaspina et al 2011), reduction and analysis of Langmuir wave and Type III Solar Radio Burst data have been done for a plasma without magnetic field. Inclusion of even the weak magnetic field of the solar wind changes the problem significantly. Extensive data Langmuir waves and their three wave decay have been obtained by the S/Waves experiments on STEREO. S/Waves measures the decay process in three dimensions and with higher frequency resolution than previously available. Observations are analyzed and compared with threshold and growth rate for the decay. Data show that Z-mode plays an important role in three wave electrostatic decay of Langmuir waves. There are then significant changes to be made in theoretical work on conversion of these waves to electromagnetic waves.