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STEREO Measurements of Rapid Density Fluctuations and Langmuir Waves

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A major part of the Swaves in-situ is to study the generation mechanism of solar Type II and III bursts, particularly their relation to density fluctuations. This requires density measurements of fractional percent relative accuracy, and time scales of milliseconds.

We have proposed to do this by measuring the voltage difference between the antennas and the spacecraft. As the antennas are made of different materials (Cu-Be) from the spacecraft, (gold over a film), and have a different ratio of sunlit area to total area, this voltage difference depends on plasma density, but in an unknown way It may also depend on electron temperature.

As the Stereo spacecr;aft were launched into the earth's foreshock, a calibration was possible using Langmuir waves to measure the plasma density. These calibrations will be discussed and results of density spectra so obtained compared with previous results.

Some preliminary relations between density fluctuations and Langmuir waves will be presented.