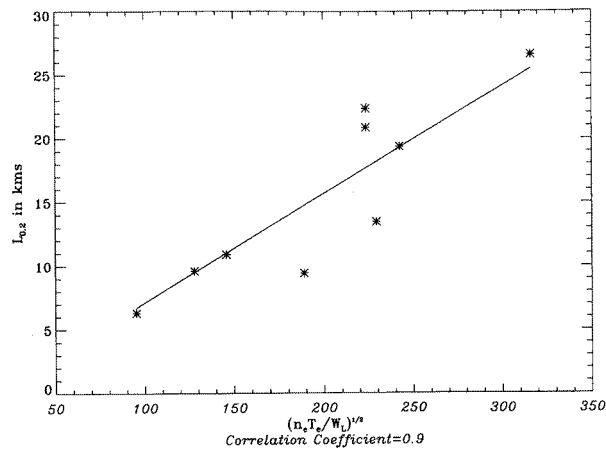
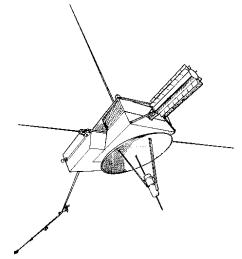




# NEW UNDERSTANDING OF SOLAR RADIO BURSTS



Recent analysis (Thejappa et al., JGR, 28279, 1999) of observed wave packet width versus normalized inverse energy density. The excellent agreement supports the idea of non-linear envelope solitons.

Streams of energetic electrons escaping along the sun's magnetic field lines into space generate so-called Type 3 radio bursts. The electrons and waves travel together to large distances from the sun. A long-standing puzzle has been how particle beams can be maintained when they are simultaneously generating the waves and should become dispersed long before they are observed. Ulysses electric field observations have now shown that the electron beams are stabilized as a result of non-linear, plasma-turbulent processes that "bunch" the waves and particles together. The bunches are packets of high frequency waves known as "envelope solitons". Thus, a major step has been taken in understanding the physics of this interesting and unique solar-interplanetary phenomenon.