



Stability and geometrical features of a large pulse in the solar wind plasma observed by Helios 1 and Helios 2 and near the Earth

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In present report we investigated a large pulse in the solar wind plasma density observed by Helios 1 and Helios 2 probes in “line-up” position and also by IMP 8 satellite near the Earth. Area of increased plasma density (1.5 time more than undisturbed solar wind density) extended by approximately 22 mln km along the X-line and had similar outer boundaries on distance of 2 mln km in the direction perpendicular to the Sun-Earth line. This strong enhancement in density was accompanied by no jumps in other basic solar wind parameters. The characteristic feature of this pulse was its sharp boundaries (several minutes) one of that was found to be rather stable and survived propagating between Helios 1,2 spacecraft at separating distance of 18 mln km or during 11 hours of the solar wind motion and from Helios 2 to Earth on a distance about 70 mln km or during 54 hours. Another boundary was exposed to a certain expansion. Possible reasons responsible for evolution of this plasma pulse such as pressure gradient, spatial inhomogeneities in the direction perpendicular to the Sun-Earth line as well as front inclinations are discussed.