

# Mirror-mode structures at Comet 1P/Halley: A comparison between VEGA1 and Giotto Flyby

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## Abstract

The pickup of freshly ionized particles emitted by the cometary nucleus creates a particle distribution in phase-space which is, amongst others, mirror-mode unstable. Many detailed studies have shown the presence of mirror-mode structures in the vicinity of comet 1P/Halley, using data from VEGA1/2 and Giotto. In the current presentation the almost similar flybys of VEGA1 and Giotto are compared with respect to the presence and occurrence rate of mirror-mode structures. An automated search on the magnetic field data is performed, using minimum variance analysis, which has proved its usefulness in earlier mirror-mode studies at Earth, Venus and comets. It is found that there is an asymmetry between the two flybys: both missions show many events before closest approach and magnetic pile up region, however, after closest approach and magnetic pile up region the mirror-modes are strongly reduced at Giotto, whereas they increase in number for VEGA1. One source of influence could be the solar wind IMF, which is different: VEGA1 IMF  $\approx (0, 0, 15)$  nT,  $V_{sw} \approx 500$  km/s and Giotto IMF  $\approx (-3/3, -4, 5)$  nT (Bx rotating over the passage),  $V_{sw} \approx 370$  km/s. In this presentation we will discuss the occurrence rate, sizes and other characteristics of the mirror-mode structures.

