

The “flip” of the pressure curves derived from measurements by the Ram and Nude gauges of ROSINA/COPS pressure sensor that occurred at the altitude of about 300-400 km above the nucleus was an unexpected and puzzling feature of COPS’ end-of-mission measurements. The major focus of the presented study is analyzing these measurements by means of the numerical modeling of the comet environment.

Because the coma at a heliocentric distance of 3.8 AU was in a collisionless regime, it can be described by solving the Liouville equation, as we have done in our analysis. We have used the SHAP5 nucleus model to account for the topology of the volatile source. Spacecraft trajectory and the instrument pointing with respect to the comet’s nucleus have been obtained with the SPICE library.

Here, we present results of our analysis and discuss the effects of the surface topology and that of the local surface volatile injection on the distribution of gas in the innermost coma of comet 67P/Churyumov–Gerasimenko.