

Heterogeneity of the Composition of the Dust Particles of 67P/Churyumov–Gerasimenko

M. Hilchenbach, J. Paquette, O. Stenzel, S. Merouane, H. Fischer, J. Rynö, D. Baklouti, A. Bardyn, H. Cottin, C. Engrand, N. Fray, K. Hornung, J. Kissel

In-situ cometary dust observations were obtained by COSIMA (COmetary Secondary Ion Mass Analyser) which was one of the scientific instruments onboard the ESA mission Rosetta that orbited the nucleus of Jupiter-family comet 67P/Churyumov-Gerasimenko. COSIMA collected cometary dust particles in the inner coma by their impact on metal target plates. These particles were subsequently imaged and identified with an optical microscope and their composition was analyzed with a secondary ion mass spectrometer. COSIMA has collected more than 1200 cometary particles in the inner coma, at various distances from two to hundreds of kilometres off the cometary nucleus. The secondary mass spectra contain ion peaks of complex mixtures of mineral compounds and organic molecules as well as molecular fragments representing the elements and molecules on the surface of these particles and the targets [1-3]. We will discuss the observations of the inner coma dust particles in view of their compositional heterogeneity as observed for the collected, imaged and analyzed cometary particles.

[1] Bardyn, A. et al. MNRAS 469, S712–S722 (2017)

[2] Hilchenbach, M. et al. ApJ, 816, L32 (2016)

[3] Stenzel, O. J. et al. MNRAS 469, S492–S505 (2017)