



## The next step for Rosetta ROSINA/DMFS data of comet 67P/Churyumov-Gerasimenko: the search for semi-volatiles species.

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Using data from Rosetta/ROSINA's Double Focusing Mass Spectrometer (DFMS), a zoo of neutral molecules have been discovered in the coma of 67P/Churyumov-Gerasimenko, which led to a wealth of new insights regarding the comet itself, its formation and the early history of our Solar System.

A comprehensive understanding of the overall comet composition requires information on all species involved i.e. the volatiles, semi-volatiles and refractories in the coma. However, while ROSINA targets volatiles and GIADA, MIDAS and COSIMA studied refractories, no instrument on Rosetta provides measurements specifically of semi-volatiles. In some circumstances, ROSINA/DFMS may provide at least some information on semi-volatiles in the coma. As semi-volatile species are progressively released from the grains into the gas coma (their release depends on cometocentric distance and grain size), they can be identified if the abundance ratio of a candidate semi-volatile species (or a fragment thereof) to a volatile species increases as a function of distance from the nucleus. This constitutes a so-called distributed source in the coma.

With a mass spectrometer like DFMS, one does not detect neutral coma species, but rather the ionized products thereof after electron impact ionization. A major difficulty is assigning the observed ions to parent neutrals. As semi-volatile species have a low abundance, sum spectra obtained through accumulation of individual DFMS spectra can improve the signal-to-noise ratio in order to provide decisive information for identification. Accurate sum spectra can only be obtained provided all instrument-dependent effects are accounted for.

This contribution focuses on the procedure used to create sum spectra and presents some typical results.