



A Statistical Survey of Low-Frequency Waves in the Inner Coma of Comet 67P/Churyumov-Gerasimenko

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Since its arrival at comet 67P/Churyumov-Gerasimenko in August 2014 the magnetometer experiment, as part of the Rosetta Plasma Consortium (RPC), onboard the Rosetta spacecraft has been detecting low-frequency waves in the cometary plasma environment. These waves are present in frequency ranges of 10-100 mHz and can be observed intermittently if Rosetta is close to the comet. We present a method of identifying the exact frequency and energy content of the disturbances automatically by calculating power spectral densities and fitting a polynomial to pinpoint the location of the maximum. An additional elimination criterium discards any detected waves for which the power spectral density does not exceed the confidence bounds of a corresponding solar wind spectral density. With this method, hourly frequencies are determined and the ensemble of all frequencies is used to perform a statistical survey for a time frame of approximately six months.

This investigation of the influence of plasma parameters such as the background magnetic field provides a reference point for the classification of the waves and information on their origin and trigger mechanism. Additionally, temporal and spatial distributions are examined. Overall this investigation gives an overview of the global structure of the disturbed plasma over a wide range of time.