

Surface Temperature and Properties of the Nucleus of Comet 67P/CG as Derived by Rosetta/VIRTIS

F. Tosi¹, F. Capaccioni¹, M. T. Capria¹, S. Mottola², M. Ciarniello¹, G. Filacchione¹, M. Hofstadter³, M. Formisano¹ and the Rosetta/VIRTIS Team

¹ *Istituto Nazionale di Astrofisica–Istituto di Astrofisica e Planetologia Spaziali (INAF-IAPS), Rome, Italy*

² *Institute of Planetary Research, Deutsches Zentrum für Luft- und Raumfahrt (DLR), Berlin, Germany*

³ *Jet Propulsion Laboratory (JPL), Pasadena, CA, United States*

We report on the data acquired by the Visible InfraRed and Thermal Imaging Spectrometer (VIRTIS) onboard the Rosetta orbiter, which have been used to retrieve time-resolved maps of comet 67P/Churyumov-Gerasimenko at an unprecedented spatial resolution ≤ 15 m/px. We begin by describing the temperature maps obtained in the inbound leg of the orbit covering August and September 2014, at heliocentric distances ranging between 3.62 and 3.31 AU. Due to the overall low thermal inertia of the nucleus surface, the surface temperature is essentially dominated by the instantaneous value of the solar incidence angle and the heliocentric distance. Here we discuss the results obtained for different morphological regions as a function of illumination conditions and emphasizing the role of self-heating in a complex nucleus shape. We then discuss direct estimates of temporal temperature gradients in the ‘neck’ area of the nucleus undergoing sudden daytime shadowing, comparing them with some theoretical profiles. Finally, we describe seasonal effects observed in a smooth area within the Imhotep region, also combining the VIRTIS measurements with those obtained from MIRO over the same period.