CONTROL ID: 2565679

TITLE: The outburst sequence of 67/P on 2015 September 13 as seen by VIRTIS/Rosetta

ABSTRACT BODY:

Abstract (2,250 Maximum Characters): On 13 September, 2015, the Visual, Infrared and Thermal Imaging Spectrometer (VIRTIS) onboard Rosetta observed strong, anomalous activity of the coma of 67P/Churyumov-Gerasimenko starting at 13:40 UTC, in a range of latitude between -26° and -40° and longitude between 265° and 280°. VIRTIS is an imaging spectrometer in the spectral range 0.25-1 mm (VIRTIS- M) and a high-resolution spectrometer in the range 2-5 mm (VIRTIS- H) on board the Rosetta spacecraft. The instrument observed one large outburst followed by two mini-outbursts that occurred approximately one hour thereafter. This is probably the highest temporally resolved dataset available from a remote sensing instrument of an outburst observed on 67P. The data cover the full spectral range of the two channels and allow studying both dust and gas properties to derive information on the underlying physical mechanism driving the outbursts.
The preliminary results of the outburst sequence indicate that they occur on the daylight side of the nucleus. They are characterized by a short duration and decay that lasts typically 15 minutes for the large outburst and 5 minutes for the two mini outbursts. The spatial and temporal distribution of the dust indicates a complex light curve for each event showing internal structures. The large outburst shows a bluer color than the background coma in the range of 2-2.5mm with a value around 1% per 100 nm, which can be interpreted as a change of dust properties and perhaps the presence of icy grains. However, the spectral signature of water ice at 3 mm is not detected in the outburst material, or in the background coma. In the range of 0.45-0.75 mm, the spectral slope shows a redder value in the outburst material (15 % per 100 nm) than in the background (12 % per 100 nm).The dust temperature, measured by fitting the thermal continuum, is much higher for the outburst material than for the background coma. No significant increase in CO2 or H2O production is detected. Both the bluer color in the IR and the higher temperature suggest that the outburst material is dominated by small dust particles. Further analysis will be presented during the congress.

CURRENT * CATEGORY: Comet Physical Characteristics: Coma

CURRENT : None

AUTHORS (FIRST NAME, LAST NAME): Giovanna Rinaldi[1], Dominique Bockelee-Morvan[2], Cedric Leyrat[2], Fabrizio Capaccioni[1], Gianrico Filacchione[1], Stéphane Érard[2], Jordan Steckloff[3], Gian-Paolo Tozzi[4], Uwe Fink[5], Lyn Doose[5], Giuseppe Piccioni[1], Maria Teresa Capria[1],

Michael R. Combi[8], Maria Cristina De Sanctis[1], David Kappel[6], Andrea Longobardo[1], Alessandra Migliorini[1], Ernesto Palomba[1], Fredric W. Taylor[7], Federico Tosi[1]

INSTITUTIONS (ALL): 1. IAPS-INAF, Roma, Italy.
2. LESIA-Observatoire de Paris, Meudon, Paris, France.
3. PSI, Tucson, AZ, United States.
4. Osservatorio di Arcetri, Firenze, Italy.
5. Univ. of Arizona, Tucson, AZ, United States.
6. DLR, Berlin, Germany.
7. University of Oxford, Oxford, United Kingdom.
8. University of Michigan , Ann Arbor, MI, United States.

Contributing Teams: VIRTIS-Team