



Observations of the 19 February 2016 Outburst: Heating of the Inner Coma by Dust Raised in an Avalanche

Mark Hofstadter (1), Nicolas Biver (2), and the MIRO Team

(1) Jet Propulsion Laboratory/California Institute of Technology, Pasadena, United States (mark.hofstadter@jpl.nasa.gov), (2) LESIA/Obs. de Paris, Meudon, France, (3) LERMA/Obs. de Paris, Paris, France, (4) Max Planck, Göttingen, Germany, (5) National Central University, Jhongli, Taiwan, (6) Univ. of Massachusetts, Amherst, United States

Over the course of its mission, the Rosetta spacecraft observed many outbursts from the nucleus of comet 67P/CG (e.g. Vincent et al. 2016, MNRAS). One well-characterized outburst occurred on 19 February 2016, when the spacecraft happened to be pointed in a fortuitous direction for an extended period of time and most instruments were collecting data (Grün et al. 2016, MNRAS). The Microwave Instrument for the Rosetta Orbiter (MIRO) was measuring gas abundances, velocity, and temperatures in the inner coma during the outburst. MIRO determined that temperatures rose significantly (from ~ 20 to 50 K) soon after large amounts of dust were seen rising from the nucleus by other instruments, but before any significant increase in gas density occurred. We suggest that the observations can be explained by a) The outburst being triggered by an avalanche or collapse on the nucleus surface, and b) The dust raised in the outburst radiatively driving coma gases to higher temperatures. This and other features of the outburst will be discussed, and how such observations lead to a better understanding of cometary activity and the structure of cometary comae.