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TITLE: Using the EUV to Weigh a Sun-grazing Comet as it Disappears in the Solar Corona

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AUTHORS (FIRST NAME, LAST NAME): William Dean Pesnell[1], Carolus J Schrijver[2], John C. Brown[3], Karl Battams[4], Pascal Saint-Hilaire[5], Hugh S Hudson[3,5], Wei Lui[6,2]

INSTITUTIONS (ALL): 1. NASA / GSFC, Greenbelt, MD, United States.
2. Lockheed Martin ATC, Palo Alto, CA, United States.
3. School of Physics and Astronomy, University of Glasgow, Glasgow, United Kingdom.
4. Naval Research Laboratory, Washington, DC, United States.
5. Space Sciences Laboratory, Berkeley, CA, United States.
6. Stanford University, Palo Alto, CA, United States.

Title of Team:

ABSTRACT BODY: On July 6, 2011, the Atmospheric Imaging Assembly (AIA) on the Solar Dynamics Observatory (SDO) observed a comet in most of its EUV passbands. The comet disappeared while moving through the solar corona. The comet penetrated to 0.146 solar radii ($\sim~100,000$ km) above the photosphere before its EUV faded. Before then, the comet's coma and a tail were observed in absorption and emission, respectively. The material in the variable tail quickly fell behind the nucleus. An estimate of the comet's mass based on this effect, one derived from insolation, and one using the tail's EUV brightness, all yield ~ 50 giga-grams some 10 minutes prior to the end of its visibility. These unique first observations herald a new era in the study of Sun-grazing comets close to their perihelia and of the conditions in the solar corona and solar wind. We will discuss the observations and interpretation of the comet by SDO as well as the coronagraph observations from SOHO and STEREO. A search of the SOHO comet archive for other comets that could be observed in the SDO/AIA EUV channels will be described.

KEYWORDS: [6000] PLANETARY SCIENCES: COMETS AND SMALL BODIES, [6025] PLANETARY SCIENCES: COMETS AND SMALL BODIES / Interactions with solar wind plasma and fields, [7509] SOLAR PHYSICS, ASTROPHYSICS, AND ASTRONOMY / Corona, [7549] SOLAR PHYSICS, ASTROPHYSICS, AND ASTRONOMY / Ultraviolet emissions.

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SPONSOR NAME: William Pesnell

Additional Details

Previously Presented Material:

Contact Details

CONTACT (NAME ONLY): William Pesnell
CONTACT (E-MAIL ONLY): william.d.pesnell@nasa.gov