Geophysical Research Abstracts
Vol. 12, EGU2010-15311-1, 2010
EGU General Assembly 2010

The Impact of a Large Object with Jupiter in July 2009

Agustin Sanchez-Lavega (1), A. Wesley (2), G. Orton (3), P. Chodas (3), R. Hueso (1), S. Perez-Hoyos (1), L. Fletcher (4), P. Yanamandra-Fisher (3), J. Legarreta (1), J. M. Gomez-Forrellad (5), and the IOPW-Jupiter Impact Team

(1) Universidad Pais Vasco, Spain, (2) Acquerra Pty. Ltd., Australia, (3) Jet Propulsion Laboratory, Caltech, USA, (4) Oxford University, UK, (5) Fundacio Observatori Esteve Duran, Barcelona, Spain

The only major impact ever observed directly in the Solar System was that of a large fragmented comet with Jupiter in July (1994) (Comet Shoemaker-Levy 9; SL9). We report here the observation of a second, single, large impact on Jupiter that occurred on 19 July 2009 at a latitude of -55° with an orthogonal entry trajectory and a lower incidence angle compared to those of SL9. The size of the initial aerosol cloud debris was 4,800 km East-West and 2,500 km North-South. Comparison its properties with those produced by the SL9 fragments, coupled with dynamical calculations of possible pre-impact orbits, indicates that the impactor was most probably an icy body with a size of 0.5-1 km. We calculate that the rate of collisions of this magnitude may be five to ten times more frequent than previously thought. The search for unpredicted impacts, such as the current one, could be best performed in the near-infrared methane absorption bands at 890 nm and in the 2.12 to 2.3 μm K methane-hydrogen absorption band, where the high-altitude aerosols detach by their brightness relative to Jupiter's primary clouds. We present measurements of the debris dispersion by Jovian winds from a long-term imaging campaign with ground-based telescopes.

Ackowledgements: Work was supported by the Spanish MICIIN AYA2009-10701 with FEDER and Grupos Gobierno Vasco IT-464-07, by NASA funds to JPL, Caltech, by the NASA Postdoctoral Program at JPL, and by the Glasstone Fellowship program at Oxford.