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URSIDS METEORS 2016

P. Jenniskens, SETI Institute and NASA Ames Research Center, reports that the earth encountered the A. D. 1076 ejected dust of comet 8P/Tuttle on 2016 Dec. 22d11h35m UTC, at solar longitude 270.825 +/- 0.010 deg (equinox J2000). The Ursid meteor shower rates increased during the time encompassing the span of solar longitude 0.13 +/- 0.03 deg. (full-width-at-half-maximum). In California, the "Cameras for Allsky Meteor Surveillance" project detected 3, 5, 5, 3, 2, 0, 0, 2, 4, 2, 2, 4, 5, 6, 3, 7, 8, 9, 21, 24, 16, 16, 15, 15, 7, 7, and 5 Ursids, in intervals of 0.02 deg. starting at 270.44 deg. solar longitude, during a clear and transparent night. Meteors radiated from a geocentric radiant R.A. = 219.1 +/- 3.9, Dec. = +75.6 +/- 0.9 deg., with velocity Vg = 33.1 +/- 0.9 km/s.

E. Lyytinen, Helsinki, Finland, had calculated an encounter with the A. D. 1076 dust ejecta of 8P/Tuttle at 2016 Dec. 22d10h05m UTC, at solar longitude 270.760 deg. (c.f., Jenniskens, 2006, *Meteor Showers and their Parent Comets*, p. 641).

H. Sugimoto of Japan first noticed elevated meteor rates during 270.72–271.05 degrees solar longitude in compiled radio forward meteor scatter observations by the worldwide online Radio Meteor Observatory (c.f., website URL http://www5f.biglobe.ne.jp/~hro/Flash/2016/URS/index.html). F. Verbelen at Kampenhout, Belgium, reported a weighted averaged hourly count of overdense reflections centered on solar longitude 270.825 +/- 0.010 degrees, with a Full-Width-at-Half-Maximum of 0.20 +/- 0.05 degrees, in good agreement (c.f., website URL http://www.imo.net/enhanced-radio-activity-of-2016-ursids/). This activity is now confirmed to have come from the Ursid meteor shower.