Theoretical stream of comet 12P/Pons-Brooks

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We modeled the theoretical stream of the Halley-type comet 12P/Pons- Brooks in a single perihelion passage that was 1,000 orbital periods in the past (the orbital period is 70.85 years). We generated 10,000 particles with randomly distributed directions of their velocity vectors. The ejection velocity for these particles was set to 37.51 m/s (equal to 1/1000 of the perihelion velocity). We followed the dynamical evolution of the stream of particles during the numerical integration from the moment of their ejection. From the total number of 10,000 particles, 1,227 particles are crossing or passing around the Earth's orbit at a distance smaller than 0.05 au. These particles have a well-defined radiant predicted on the northern sky, with a high declination (from about 61° to 81° – figure). The subsequent identification with available databases of the meteors can confirm whether the meteor shower is real or not. For this, we will use three databases: the photographical IAU MDC (Lindblad et al., 2003), the radio-meteor database (Hawkins, 1963; Sekanina & Southworth, 1975), and the SonotaCo video-meteor database (SonotaCo, 2009).

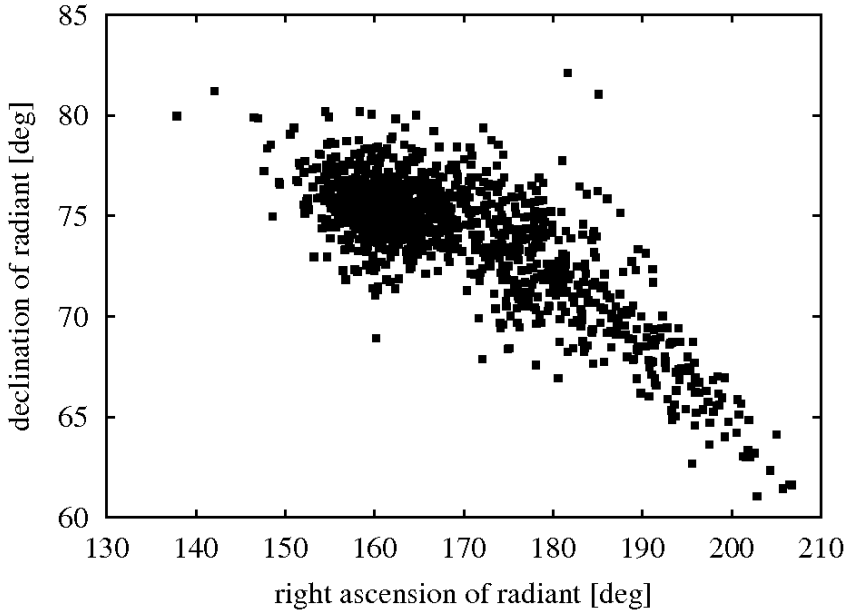

Figure: The position of the radiant of the theoretical meteors associated with comet 12P/Pons-Brook.

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References: Lindblad B. A., Neslušan L.,Porubčan V., & Svoreň J.: 2003, Earth, Moon, Planets 93, 249; Hawkins G. S.: 1963, Smithsonian Contr. Astrophys. 7, 53; Sekanina Z., & Southworth R. B.: 1975, Physical and dynamical studies of meteors. Meteor-fragmentation and stream-distribution studies. Final report., Smithsonian Astrophys. Obs., Cambridge; SonotaCO.: 2009, WGN, Journal of the IMO 38, 55 (http://sonotaco.jp/doc/SNM).