

Comet C/1975 T2 and λ -Ursae Majorid shower

M. Hajduková Jr. (1) and L. Neslušan (2)

(1) Astronomical Institute, Slovak Academy of Science, Dúbravská cesta 9, 84504 Bratislava, Slovakia, (astromia@savba.sk)

(2) Astronomical Institute, Slovak Academy of Science, 05960 Tatranská Lomnica, Slovakia, (ne@ta3.sk)

Abstract

We model the meteoroid stream of the long-period comet C/1975 T2 (Suzuki-Saigusa-Mori). The stream crosses the Earth's orbit only in a single section; therefore, only a single observable meteor shower that originated in this comet is predicted. We identified this shower with the established λ -Ursae Majorid shower, No. 524 in the IAU MDC list of showers, and found its real counterparts in the video meteor databases. The found relationship between the C/1975 T2 and λ -Ursae Majorids confirms a previous suggestion by other authors.

Results and Conclusions

In our recent work modeling streams, we concentrate on long-period comets. Their streams have not yet been modelled as often as those of short-period parent bodies. This enables us to find new parent bodies of known meteor showers among long-period comets, and/or to predict new meteor showers which originate in their nucleus.

In this study, we modelled a theoretical stream of the long-period comet C/1975 T2 using the procedure developed by Neslušan [1, 2]. For four perihelion passages of the parent comet in the past, we modelled streams consisting of 10 000 particles, and followed their dynamical evolution up to the present. The models were characterized by a variety of values of free parameters, evolutionary time t_{ev} and the strength of the Poynting-Robertson drag β .

The part of the orbital corridor of the stream which passed in the vicinity of the Earth's orbit has not changed much during the last 80 millennia. This is why C/1975 T2 produces only a single shower in the Earth's atmosphere.

We identified the predicted shower with λ -Ursae Majorids, No. 524 in the IAU MDC list of established showers. We also selected real counterparts of the predicted shower in several video databases [3, 4, 5]. Our modeling confirmed the relationship between the shower and comet C/1975 T2, as suggested by Andrei'c et al. [6].

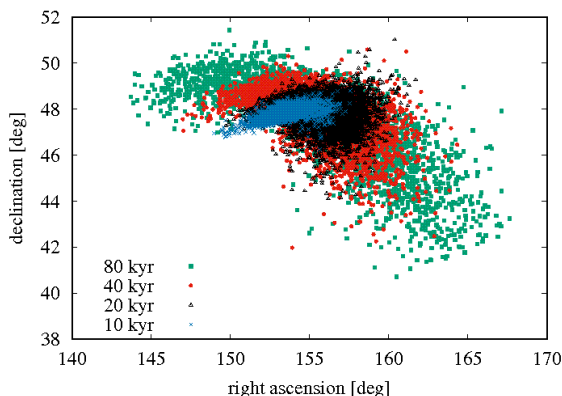


Figure 1: The positions of the predicted radiants in various models for the P-R-effect parameter $\beta = 10^{-11}$ and a series of evolutionary times, 10, 20, 40, and 80 kyr are shown.

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