Orbital Structure of Meteoric Complex in a Vicinity of the Earth's Orbit by Kazan Meteor Radar. Type of Meteor Orbits.

S.A. Kalabanov, A.D. Sidorova, A.F. Nasirov
Kazan State University, Russia

sergei.kalabanov@ksu.ru

Abstract. The orbital structure of a meteoric complex in a vicinity of the orbit of the Earth is mainly defined by conditions of its observation from the Earth. In our experiments orientation of aerials of Kazan meteoric radar varied each 15 minutes on Norht, East, South, West - directions to provide the maximal review of northern celestial hemisphere together with an Earth rotation. Nevertheless, the antiapex area of celestial sphere was practically inaccessible because of influence of the physical factor of small radar sensitivity to meteors with velocities less than 18 km/s.

On the contrary, the meteoric streams in which movements are opposite in comparison with the Earth movement, it is accessible to observe within summer and autumn months.

In the given work the data of long-term observation of meteors with the radiants which are setting within the limits of 25 degrees of the Earth apex during its moving on celestial sphere from August till November 1986 are resulted. Conditions of observation have defined an area of orbits adjoining to ecliptic one. In summer months the orbits from a small part of a southern hemisphere were registered also. Predictably, conditions of a meeting of meteors with the Earth apex area have defined two orbit types: internal orbits with aphelion $Q \sim 1$ AU and with a wide spectrum of perihelion distances and external orbits with perihelion $q \sim 1$ AU and with a wide spectrum of aphelion distances. Most of all it is observed orbits close to a circular one, at which $Q \sim 1$ and $q \sim 1$. The change of microstream orbit element distribution from the change of apex orientation in August – November was discussed. Three-dimensional maps of distribution of microstreams and numbers of meteors in them on perihelion coordinates, perihelion and aphelion distances and inclinations are constructed.

All shown data were extracted from the discrete quasitomographic method that is constantly improved in terms of accuracy.