

The distribution of meteor substance in the Galactic coordinate system according to the MARS radar database and SonotoCo's TV catalogue

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Introduction

Hyperbolic meteors may be associated with the "extrasolar" space. In this case the properties of the "extrasolar" movement may be occurred in the orbital parameters of the Earth meteors. Some of the observations are bearing out that idea. There are two large databases of meteoroids' orbital elements: MARS radar one obtained during 1972-1978 (Ukraine) [1-2] and SonotoCo's TV catalogue [3-4] obtained during 2007-2013 (Japan). Purpose of the research: search "extrasolar" sources of meteor substance in the Earth atmosphere using positions of meteor radiants in the Galactic coordinate system.

Method of analysis, and Results

Coordinates of apexes of the moving Sun in Equatorial and Galactic systems we can see using Table. We accept that the Galaxy Apex coordinates equals: $l \sim 100^\circ$, $b \sim -4^\circ$.

Table Coordinates of apexes of the moving Sun in Equatorial and Galactic coordinate systems

Apex of Sun movement respect	2nd Eq. Syst.		Constellation		Galactic Syst.	
	α^0	δ^0			l^0	b^0
Nearest stars	270	30	1	Her	56	23
Interstellar gas	258	-17	2	Oph	6.0	12
Center of the Galaxy	318	48	3	Cyg	90	0

We can search such coordinates among observed meteor radiants in the Earth atmosphere (Fig. 1).

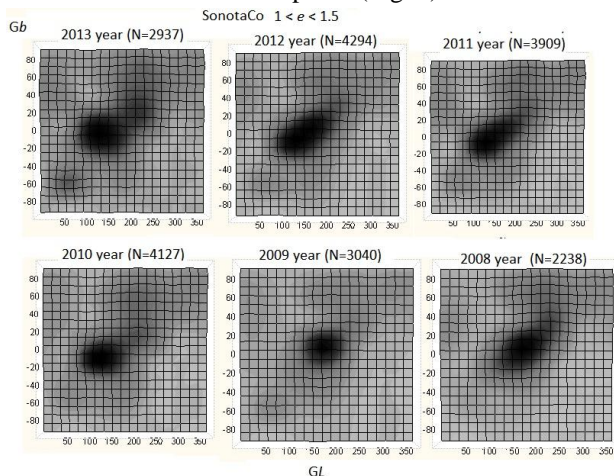


Fig 1 Position of radiants (in b and l , the Galactic coordinate system) of hyperbolic meteoroids ($1 < e < 1.5$) from the SonotoCo TV catalogue [3-4] during 2008-2013

We used different criteria to cut the data and to choice samples, e.g.: $0.9 < e < 1$; $1.0 < e < 1.1$; $Q < 1.15$ AU; $Q > 50$ AU; $1.15 < Q < 5$ AU; $5 < Q < 50$ AU; $V_h > 46$ km/s (Fig.2).

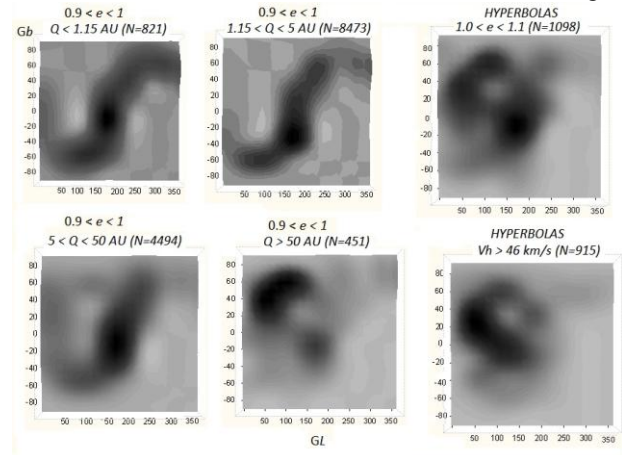


Fig 2 Position of radiants (in b and l , the Galactic coordinate system) of hyperbolic and elliptic ($0.9 < e < 1$) meteoroids from the MARS radar database [1-2] during 1972-1978

Conclusions

Differences were found in the distributions for two databases, and different samples from ones. As the conclusion in terms of rough analysis we can say that for the MARS hyperbole in the Galactic coordinates we identified concentration of radiants of orbits relative the Galaxy and Sun apexes (to points 1, 3 according to Table).

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