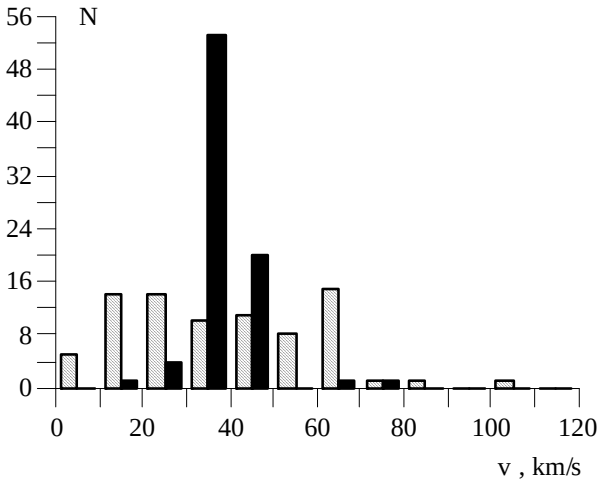
TRAJECTORY PARAMETERS AND ORBITAL ELEMENTS OF 98 SEPTEMBER METEORS FROM DOUBLE STATION TV OBSERVATIONS IN 2001 AND 2003. P. M. Kozak, O. O. Rozhilo, Y. G. Taranukha Astronomical observatory, Kyiv National Taras Shevchenko University, 3 Observatorna Str., Kyiv, Ukraine, 04053, (kozak@observ.univ.kiev.ua).

Introduction: In the given paper the results of kinematical processing of double station TV meteor observations, which were carried out in September 2001 and 2003 at time range covering autumnal equinox have been considered. Calculated kinematical characteristics of 98 meteors (18 meteors of 2001 and 80 meteors of 2003) are presented as a catalogue. Except mean values of the calculated parameters their statistical errors computed with the Monte-Carlo method are shown as well [1].

Observations and data processing: TV systems of super-isocon type equipped by wide-angle photographic lenses "Jupiter-3" (F = 50 mm, F/1.5) were used for the observations. Star limit magnitude is 9.5, spatial resolution after transformation into digital format is 768×576 pixels, angular pixel size is ~4′. The angular size of the view field is ~23°.5×19°. Temporal resolution is 0.02 sec. The observational systems were placed in points A and B at distance of 54 km.

For 8 hours of the observations in September 21-22, 2001 35 meteors were registered in point A and 63 meteors in B. Only 18 double station meteors were included to the catalogue. During the observations in September 19-24, 2003 116 meteors were registered in A for 22 hours, and 196 meteors in B for 24 hours. Only 80 double station meteors were included to the catalogue. The methods described in [2] and [3], and according software "Falling Star" [1] were used for the meteor dada processing.

Short analysis of the catalogue: The catalogue is suitable for consideration as one consisting from two parts. The trajectory parameters of a meteor in Earth atmosphere, including visible trajectory length of a meteor, time of existence, positional angles of the observations, zenith distances of the radiant, altitudes of beginning, maximal brightness and ending, vectors of geocentric velocities (equatorial coordinates of the radiant and absolute value of velocity) and others are described in the first part. The vectors of meteor velocity in heliocentric coordinate system (equatorial heliocentric coordinates of the meteor radiant and absolute value of velocity) and five orbital elements of the meteor, and also the inverse values of their semi-major axes are presented in the second part. Statistical distributions of most of meteor parameters are demonstrated as an analysis of the catalogue. The distribution of geocentric and heliocentric velocities of meteors are shown in the figure.



Statistical distribution of geocentric velocities of meteors (light shading), and heliocentric ones (dark shading).

Among the particular elements in the catalogue one can note the presence of one almost stationary meteor from point B; the presence of near 14 per cent of hyperbolic meteors (most of them but not all are caused by errors of calculations of velocities); 2 meteors "moving upwards" (the latitude of beginning is lower than that of ending) and some others features. From the preliminary calculations the increasing of a height of the two meteors during their flights is not caused by errors of calculation but by the Earth sphericity. The results obtained from the catalogue analysis are used for confirmation of the existing meteor showers [4] and for a search of new ones, and also are compared with other catalogues.

References: [1] Kozak P. (2008) *EM&P, 102, 1-4*, 277-283. [2] Kozak P. (2002) *Kin. Phys. Nebesn. Tel, 18, 5*, 471-480. [3] Kozak P. (2003) *Kin. Phys. Nebesn. Tel, 19, 1*, 62-76. [4] Jopek T.J. (2009) *MDC IAU*, http://www.astro.amu.edu.pl/~jopek/MDC2007.