

On association of comet 96P/Machholz 1 and asteroid 2003EH1

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The orbital evolutions of comet 96P/Machholz 1 and the near-Earth asteroid 2003EH1 were investigated under the perturbing action of major planets for the time interval of 28 thousand years. Several criteria of orbital similarity such as the Southworth and Hawkins criterion D_{SH} [1], the Drummond criterion D_D [2] and the criterion D_N of Jopek et al. [3] were calculated and their variations were followed during this period. It was shown that comet and asteroid can be fragments of the same larger comet-progenitor of the Quadrantid complex. According all criteria a break-up of the parent comet possibly occurred near 9500 years ago. The near-Earth object 2003EH1 is really the dormant fragment of the parent comet's nucleus. A conclusion was made that comet 96P/Machholz 1, near-Earth asteroid (186256) 2003EH1 and Quadrantids meteoroid stream form the complex of related objects.

References

- [1] Southworth, R.B., Hawkins, G.S., Smith. Contrib. Astrophys., 7, pp. 261-285, 1963.
- [2] Drummond, J.D., 45, Icarus, pp. 545-553, 1981.
- [3] Jopek, T.J., Valsecchi J.B., Froeschle, C., In: Asteroids III, pp. 645-652, 2000.