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New NEODyS Graphic Tool for Orbit Visualization

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ABSTRACT

The NEODyS web-based service has recently introduced a new tool for visualizing the orbit behavior especially for chaotic objects such as the Near Earth Objects. In particular the new Graphic Tool is showing the orbit propagation of NEOs, which are presently on the Risk Page of the NEODyS system.
This tool is showing not only the nominal position of the considered NEO, but also a sample of about 2400 “Virtual Asteroids” (VAs), which are compatible with the Line-of-Variations of the NEO, typically from -3 sigma to +3 sigma, as in Figure 1.
The purpose of this new tool is to support the expert scientists on NEO dynamics to better understand the dynamics and behavior of the considered NEO. Moreover, it will be used for educational purpose in order to explain the concept of chaos for orbit determination problem.
One of the main features of this tool is the possibility to show the Target Plane for each Close Approach in Öpik coordinates, as seen in Figure 2.
The Graphic Tool allows to zoom in and out, to rotate the reference system, to speed up and down the visualization, and to show and center to a specific VA or the Earth. Furthermore, the tool allows to show the orbits of all the planets.
The ephemerides used by the Graphic Tool are computed and updated on a daily base every time new astrometric data are available. The time frame covered by the Graphic tool is from the present date up to 100 years.
For all the NEOs of NEODyS, which are not in the Risk Page, the NEODyS portal points to the Orbit Visualization Tool developed by DEIMOS under the ESA-SSA-SN-V contract for the NEO Coordination Centre portal.

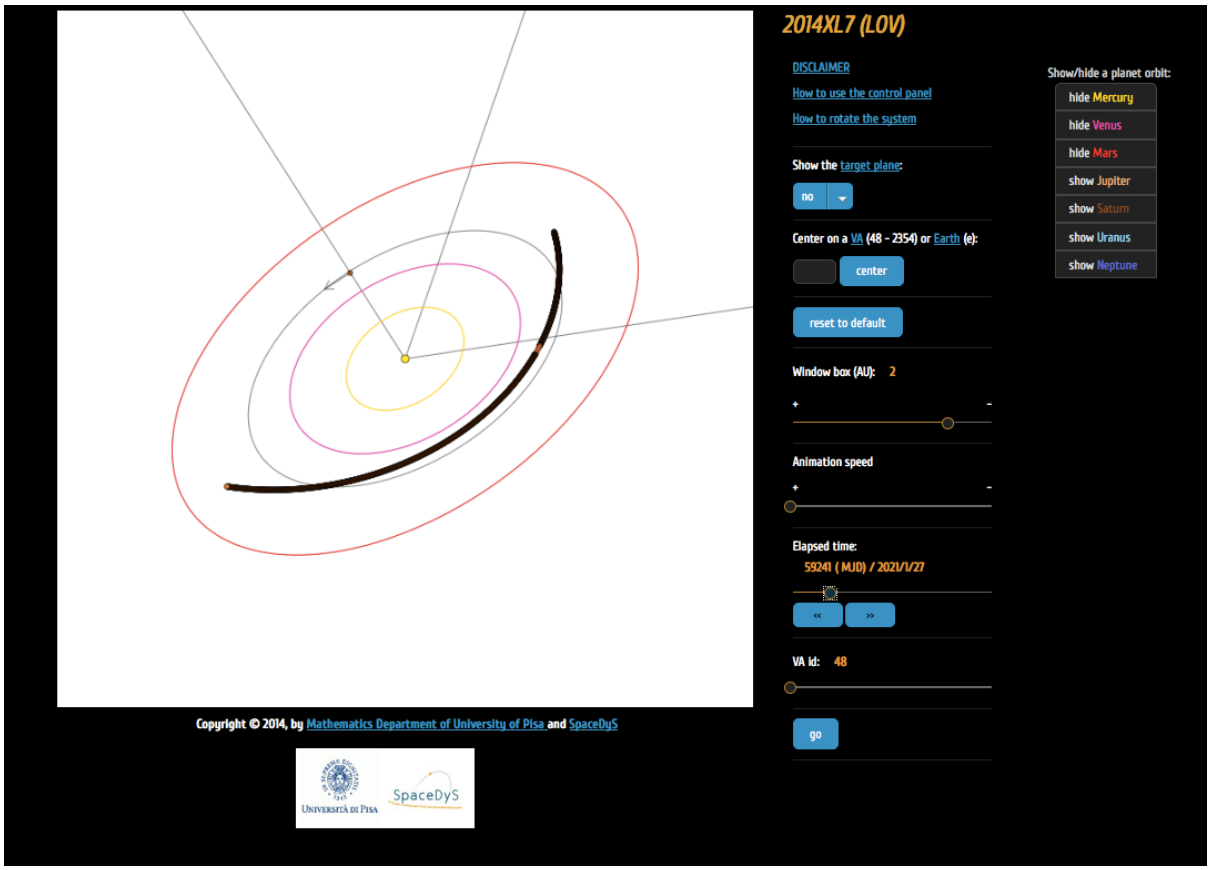

Fig. 1: Screenshot of the Graphic Tool for NEO 2014 XL7 on the Risk Page

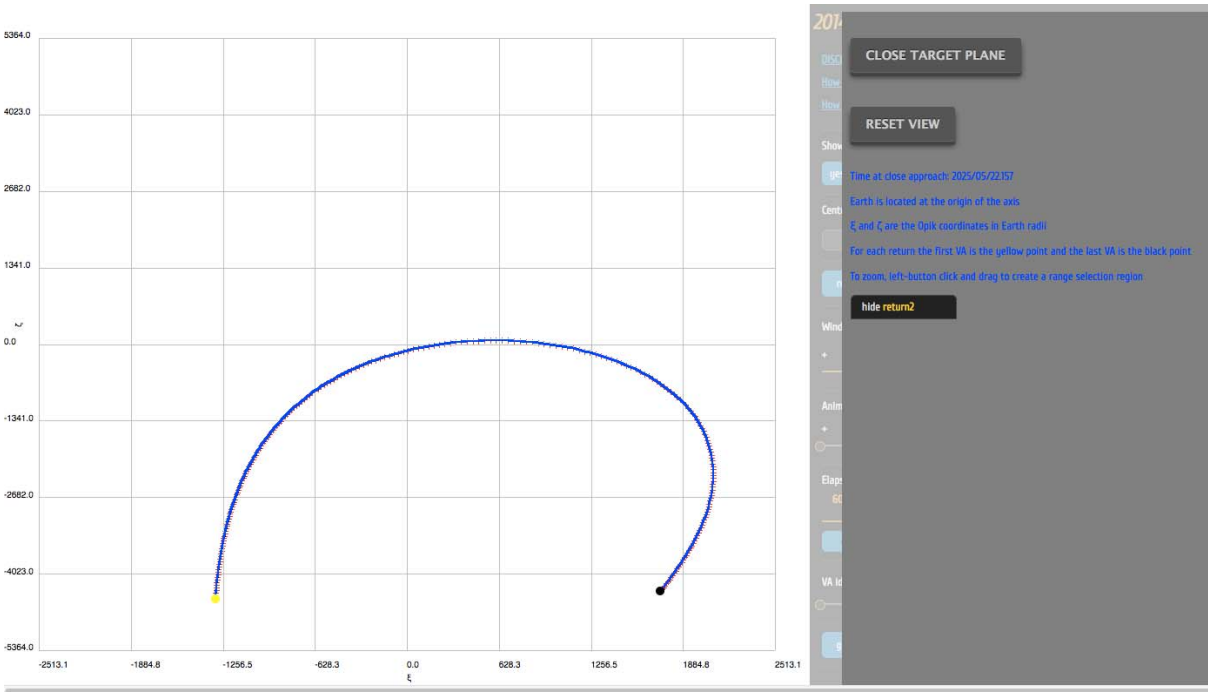

Fig. 2: Target Plane screenshot for 2014XL7 for the 2025/05/22 Close Approach

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