

Albedo and size determination of (99942) Apophis from polarimetric observations*

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The near-Earth object (99942) Apophis will make an extremely close approach to the Earth in 2029, and has currently (June 2006) a one-in-23000 chance of impacting our planet in 2036.

Accurate computation of the orbital evolution of this object is limited by insufficient knowledge of physical properties required to determine the role played by nongravitational effects (Chesley, 2005. IAU Symposium 229, 215).

From polarimetric observations obtained with FORS1 at the ESO VLT, we have obtained the first reliable determination of the albedo of Apophis, which turns out to be 0.33 ± 0.02 . We also derive an updated value of the asteroid's absolute magnitude $H=19.7 \pm 0.2$. Based on these results, we find that Apophis has a size of 250 ± 20 meters.

These results show that polarimetric observations are a very effective method to obtain accurate albedos and sizes of faint, potentially hazardous asteroids.

* Based on observations performed at the European Southern Observatory (ESO) DDT request 276.C-5030.

The work of Marco Delbo has been partially supported by the European Space Agency (ESA and and that of E. Tedesco by the National Aeronautics and Space Administration (NASA) under grant NNG04GK46G, issued through the Office of Space Science Research and Analysis Programs.