

Peer Review

Review of: "Measuring the Distances to Asteroids from One Observatory in One Night with Upcoming All-Sky Telescopes"

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The paper addresses a technique for asteroid distance determination, based on the displacement observed in subsequent observations from one telescope during one night (topocentric parallax). The approach is tested by simulation on synthetic data and verified by actual observation of two objects. The precision achieved, depending on distance and measurement conditions, is in the range of a few percent, better at shorter distances. The discussion outlines future investigations taking into account improvements from multiple observing sites, in particular using near-future facilities for large sky area monitoring, e.g., the Vera Rubin Observatory and the Argus array.

The paper is clearly structured and well written, and the results are of interest to the astronomical community, particularly those focused on asteroids and the solar system, and potentially on planetary defense. I congratulate the authors on their good work.

The paper deserves to be published in Qeios.

Minor remarks are addressed below.

- The airmass issue is discussed, with its implications on the trade-off between longer observed arcs, providing better parallax determination, and increasing disturbances due to, e.g., atmospheric dispersion variation; the subject is worth further investigation in the perspective of the practical application of the proposed technique.
- Also, for implementation, the issue of the astrometric reference frame on field stars (e.g., link to the Gaia frame) should be listed among the future developments.
- Synthetic tracking is an appealing option for moving objects, to improve on the astrometric performance trade-off between target and field stars. The compatibility with current and future instruments may be explicitly mentioned among the future work options.

- Ceres is located in the Main Belt, but it is currently labelled as a dwarf planet.

Also, a typo: a missing space between "Horizons" and "over" on page 8, third line from the bottom.

Declarations

Potential competing interests: No potential competing interests to declare.