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Title: « HD 206893 B: an exomoon candidate revealed by high-precision astrometry »

Abstract:

We report the detection of a candidate exomoon orbiting HD 206893 B, a ~20 Jupiter-mass companion located at wide separation from its host star. Using high-precision astrometry obtained with the VLTI/GRAVITY instrument, we monitored the orbital motion of HD 206893 B over short timescales, from days to months.

Unlike previous astrometric studies of massive companions, typically based on sparse measurements spanning years, our dense temporal sampling reveals deviations from a simple Keplerian motion. These short-timescale dynamical variations can be naturally explained by the presence of a bound companion, consistent with an exomoon signal. The inferred moon would have a mass of ~0.5 Mjup and orbit at ~0.22 au (corresponding to a ~9-month period) from HD 206893 B.

While additional observations are required to confirm the nature of this candidate, this work demonstrates the potential of high-cadence, high-precision astrometry to probe a previously inaccessible dynamical regime.

This approach opens a new window for the detection of exomoons, particularly around widely separated planetary-mass companions and brown dwarfs, where moons may be more massive and dynamically stable than those accessible via the transit method.