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A NOVEL ALGORITHM FOR AUTONOMOUS ASTROMETRIC MASS DETERMINATION OF
ASTEROIDS.

Abstract

Astrometric mass determination is a direct way to estimate the mass of an asteroid from the analysis of the gravitational effect it exerts on other smaller (test) bodies, when they experience a close encounter. The accuracy of the results is proportional to the number of considered encounters per target asteroid. This paper presents an algorithm capable of systematically scan current asteroid observations databases, and automatically select existing close approaches between asteroids, based on their observed-computed residuals, to perform their astrometric mass determination. The algorithm, scanning a sample of more than 1 million minor planets, can autonomously find and analyse more than 2000 strong dynamic interactions, leading to up to 10