Asteroid Trails in the Hubble Space Telescope Image Archive II

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New images including the trails of small, main-belt asteroids are continuously being added to the HST Archive. The telescope's small field of view and lack of availability for follow-up observations are more than offset by a unique and remarkable advantage: HST asteroid trails are curved due to the parallax induced by the spacecraft's orbital motion. Using HST ephemerides to fit a trail's shape, an asteroid's geocentric distance can be derived from as little as 10 minutes of imaging data. The availability of accurate distances allows an absolute magnitude (size) distribution histogram to be constructed down to a limiting magnitude of V= 24 (H= 20; diameter ~ 0.3 km) without need of full orbit determinations. Over the past four years, we have surveyed 87,000 WFPC2 images and 7,000 STIS images for asteroid trails and uncovered 491 images with trails from 206 distinct objects. We have continued to build the HST asteroid database by searching 110,000 new images and combining the results with our previous work. The asteroid size distribution we determine provides fundamental constraints on models for collisional evolution of the main belt and a census of a major source region of Earth-crossing objects.