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Extended Families in the Main Belt and in the Trojan Swarms

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The availability of highly accurate synthetic proper elements for a large number of asteroids made possible detailed studies of the structure of asteroid families. The entire region of the Vesta family is dominated by bodies with $D < 7$ km. The large spread of family members appears to be primarily due to Yarkovsky mobility, a strongly size-dependent. The proper elements of the asteroids the region (except close to mean motion resonances) are stable over very long time spans; thus chaotic diffusion could not play a significant role. The total volume of the family members with diameter less than 7 km amounts approximately to 6×10^4 cubic km, the volume of a crater with 100 km diameter and average depth 7 km. If the albedo feature, visible in the Hubble Space Telescope images, is really a crater its volume could be even larger. Thanks to the recently computed catalogs of proper elements for 1167 trojans, there are now confirmed dynamical families in the trojan swarms. This allows to begin to study the collisional evolution with constraints from observations.