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## Dynamical Evolution of Haumea Collisional Family: General Properties and Implications for the Trans-neptunian Belt

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Recently, the first collisional family was identified in the trans-neptunian belt, thus revealing the importance of collisions between trans-neptunian objects (TNOs). The family consists of the dwarf planet Haumea and at least nine other ~100 km-sized TNOs. Here, we modeled the long term orbital evolution of an ensemble of family fragments over 4 Gyr. First, we obtained collisional families that reproduced the currently known Haumea's family. In particular, ninety percent of the fragments survived the integrations concentrated in wide regions with the following orbital element ranges:  $a \sim 6-12$  AU,  $e \sim 0.1-0.15$  and  $i \sim 7-10$  deg. Most of the survivors populated the so called classical and detached regions of the trans-neptunian belt, whilst a minor fraction entered the scattered disk reservoir (<1%) or was captured in Neptunian resonances (<10%). In addition, the great majority of fragments displayed negligible long term orbital variations. This implies that the orbital distribution of the intrinsic Haumea's family can constrain the orbital conditions and physics of the collision that created the family billions of years ago. Finally, ~25-40% of the original Haumea family was lost due to planetary ejections or collisions over 4 Gyr.

Keywords: Edgeworth-Kuiper belt, Solar system, Haumea, Collisional family objects, Neptune, Trans-Neptunian objects (TNOs)