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Title: *“Detection of the Yarkovsky and YORP effect for young asteroid families”*

Abstract. Young families are families that formed in timescales of 20 Myr or less. Because of their very young age, chaotic dynamics did not have enough time to erase traces of the event that formed the family. The longitudes of nodes (and, in some cases, of pericenters) of the family members with respect to the parent body converge to within a very limited range when integrated backward over the estimated age of the family. This allows to (i) identify family members and (ii) estimate the family age with a precision not available for other, older asteroid groups. While this behavior was studied and understood in previous works, discoveries of new asteroids over the last ten years dramatically improved the number of young asteroid families such as Karin, a subfamily of the Koronis asteroid family, Veritas, Iannini, and others. Here we took advantage of this new larger sample to (i) refine the age estimate of these families, and (ii) detect and study the impact that the Yarkovsky and YORP effects had on the group dynamical evolution. The Karin family should be 5.764 ± 0.011 Myr old, and the YORP effect was most likely responsible for affecting the spin obliquity distribution of the $D < 2$ km sized Karin population, producing a bimodal distribution. The Veritas family is found to be 8.23 ± 0.37 Myr old, and (490) Veritas is most likely an interloper. Despite the very chaotic dynamical environment of this family, we were able to infer Yarkovsky induced drift rates for 274 of the most regular family members. Preliminary results for other young families may also be briefly discussed in this work.

Joint work with Dr. David Nesvorný and Dr. David Vokrouhlický.