

The Konig asteroid family

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We selected Konig Family (KF) members using the base of synthetic proper elements and the Hierarchical Clustering Method (HCM).

1 Introduction

Using synthetic proper elements we can select asteroids that belong to a given family. According to AstDyS¹ (Asteroids Dynamic Site), families of asteroids can be divided into: families of fragmentation type (21 types until August 2017), cratering families (9), young families (6) and families with one side only (11). Konig Family (KF) belongs to young families of asteroids, and it was studied earlier by Spoto et al. (2015) and Brož et al. (2013). The age of Konig family is estimated to be around 51 Myr by Spoto et al. (2015) and to be less than 100 Myr by Brož et al. (2013).

2 Method

To compute the population of KF, we used the Hierarchical Clustering Method (HCM) presented by Zappala et al. (1990) and we updated synthetic proper elements base available at the AstDyS site. Synthetic proper elements are computed according to Knežević & Milani (2000, 2003). Using the HCM, we computed parameter v_{cut} , i.e. phase velocity at which all searched asteroids belong to the KF. Parameter v_{cut} is commonly used for the purpose to separate different families (Radović et al., 2017; Włodarczyk & Leliwa-Kopystynski, 2014).

The population of KF depending on the given parameter v_{cut} is presented in Fig. 1. It is visible that for $v_{\text{cut}} = 71 \text{ m s}^{-1}$ most of the known KF asteroids are situated. For greater values of v_{cut} we join so called interlopers, i.e. asteroids which do not belong to primary pieces formed in the past by collisions with the parent body of the KF.

3 The elimination of interlopers

We eliminated asteroids for which the known albedos are outside albedo of the asteroid (3815) Konig. We searched for albedos of asteroids from the Catalogue: NEOWISE Diameters and Albedos V1.0 (Mainzer et al., 2016).

Fig. 2 shows KF members in the proper elements phase space at the present time. It is visible that KF members moving away from the center of KF mostly belong to KF despite of about 39% asteroids that were rejected from the first choice of selection. In addition, we can see that asteroid (3815) Konig is placed in the geometric center of KF. We plan to compute the age of the KF in the future work.

¹<http://hamilton.dm.unipi.it/>

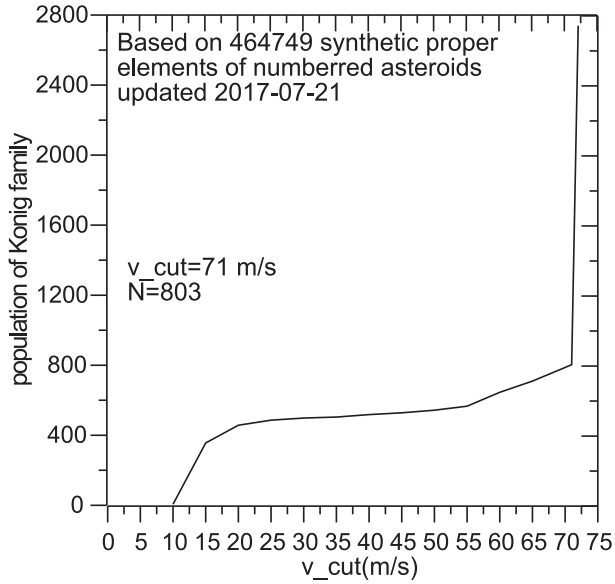


Fig. 1: Population of KF versus v_{cut} parameter.

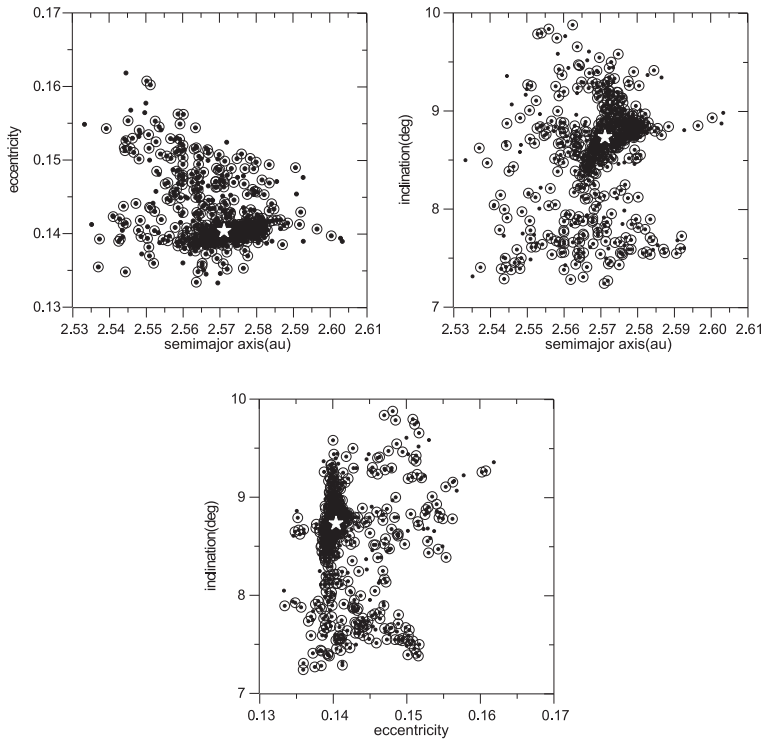


Fig. 2: KF in proper elements. 489 KF members (circles) are selected from starting 803 asteroids (dots).

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