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# Call for observations of asteroid 2012 FZ<sub>23</sub> and its association with a southern meteor shower

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This talk addresses the topic of a meteoroid stream parent body in relation to meteor showers observed in the southern hemisphere. We carry out a further search to investigate the possible genetic relationship of the asteroid 2012 FZ<sub>23</sub> with the  $\delta$  Chamaeleontids meteor shower. Finally, we suggest that future investigations need to be directed to observations in southern hemisphere.

## 1 The asteroid 2012 FZ<sub>23</sub>

Asteroid 2012 FZ<sub>23</sub> belongs to the Apollo group. The Tisserand parameter for the orbit has a value of 2.283 with respect to Jupiter, which indicates a comet-like orbit. The diameter of the asteroid, calculated from the absolute magnitude, is in the range of 1.33–2.66 km. All this makes this asteroid a good candidate for being a dormant comet.

## 2 Simulation

The model of generation and evolution of a meteoroid stream in the Solar System is taken from Vaubaillon et al. (2005). The asteroid's orbital elements and physical properties are taken from the JPL Horizons website<sup>1</sup>. The ejections of meteoroids from the asteroid's surface took place when the asteroid was passing its perihelion between 1000 and 2012. Next, the orbits of ejected meteoroids were integrated to the year 2050. If a meteoroid is sufficiently close to the Earth (within 0.05 AU from our planet), its orbital parameters are saved.

## 3 Results

The mean radiant of the generated meteoroid stream is shown in Table 1.

Table 1 – Radiant location of the  $\delta$  Chamaeleontids and mean radiant of the generated meteoroid stream.

Stream	$\lambda_{\odot}$	$\alpha$	$\delta$	$V_{\text{geo}}$ (km/s)
$\delta$ -Chamaeleontids	325°00	254°40	−86°10	42.60
Generated stream	359°38	271°84	−84°67	41.88

In the IAU MDC<sup>2</sup>, we found that the radiant position of the simulated particles looks similar to the radi-

ant of the  $\delta$  Chamaeleontids shower (from the working list). The most distinct difference between the simulated stream and the  $\delta$  Chamaeleontids is in the solar longitude, possibly due to precession.

## 4 Conclusion

We have investigated the orbital evolution of a meteoroid stream originating from the asteroid 2012 FZ<sub>23</sub>. If the asteroid was active in the past, it might be a parent body for a meteor shower observed on the southern hemisphere.

The  $\delta$  Chamaeleontids shower still remains on the working list of the IAU MDC. This shower was first noticed in 1975 (Gartrell and Elford, 1975). Since then, there is no other information about this stream. Unfortunately, most of the meteor observations have been carried out in the northern hemisphere while observations in the southern hemisphere are limited. Thus, we suggest that southern streams should become high-priority targets for further new observation campaigns.

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<sup>1</sup><http://ssd.jpl.nasa.gov/sbdb.cgi>.

<sup>2</sup>[http://www.astro.amu.edu.pl/~jopek/MDC2007/Roje/roje\\_lista.php?corobic\\_roje=0&sort\\_roje=0](http://www.astro.amu.edu.pl/~jopek/MDC2007/Roje/roje_lista.php?corobic_roje=0&sort_roje=0).