

Luego pienso en el título Va a estar chilero

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Abstract

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Introduction

Near-Earth Objects (NEOs) are comets and asteroids that have been nudged by the gravitational attraction of nearby planets into orbits that allow them to enter the Earth's neighborhood. Composed mostly of water ice with embedded dust particles, comets originally formed in the cold outer planetary system while most of the rocky asteroids formed in the warmer inner solar system between the orbits of Mars and Jupiter.¹

A meteoroid is generally defined as an asteroid or comet fragment that orbits the Sun and has an approximate size between ten microns and a meter or so. Meteors, or "shooting stars", are the visible paths of meteoroids that have entered the Earth's atmosphere at high velocities. A fireball is an unusually bright meteor that reaches a visual magnitude of -3 or brighter when seen at the observer's zenith.²

Near-Earth Asteroids (NEAs) are small bodies of the Solar System with perihelion distance q $1.3 AU$ (Astronomical Units) and aphelion distances Q $0.983 AU$, whose orbits approach or intersect Earth orbit. The NEAs are classified into three main classes: Apollo, Amor and Aten on the basis of derived orbital parameters.³

Potentially Hazardous Asteroids (PHAs) are a special subset of NEAs that, according to The Center for Near-Earth Object Studies (CNEOS), have an absolute magnitude (H) of 22.0 or less that can come close to the Earth and are large enough to cause significant

damage in the event of an impact.⁴

Sentry is a highly automated collision monitoring system that continually scans the most current asteroid catalog for possibilities of future impact with Earth over the next 100 years. Whenever a potential impact is detected it will be analyzed and the results immediately published here, except in unusual cases where we seek independent confirmation.⁵

Data and Methods

Database and analysis

The data about fireballs, NEOs, NEAs and impact probabilities have been collected from the database of The Center for Near-Earth Object Studies (CNEOS) and its monitoring system Sentry. The parameters studied include absolute visual magnitude (H), impact probability, impact energy (kt) and geographic location of fireball objects.

To determine if the impact energy (kt) of fireballs is consistent with some type of distribution it was decided to use the logarithm of the data and then a histogram was made with the counts of the impact energy ($\log(kt)$) in intervals of 0.2 . With these data some distribution fit were applied to confirm which one were more accurate.

At first it was used the covariance matrix to determine the linear bond between two variables, but due to the correlation not been linear it was discarded. Then proceeded to use Pearson's and Spearman's

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correlation coefficients to analyze more accurately the data and determine if a correlation exists and which type it is.

At last, using python and various libraries such as pandas, numpy, plotly, a graphic representation of geographic locations with it's respective impact enegry as the size of the reported events was made. This way it was possible to observe the frequency of similar values of impact energy (kt).

Results

Here there goes the results

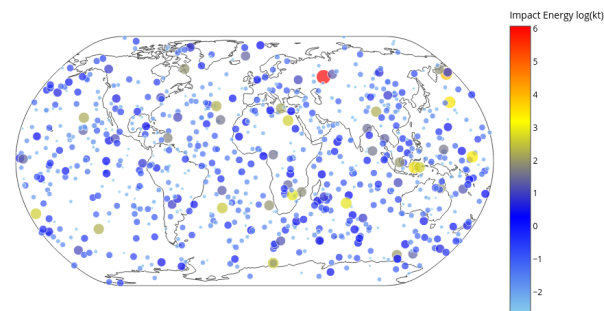


Figure 1

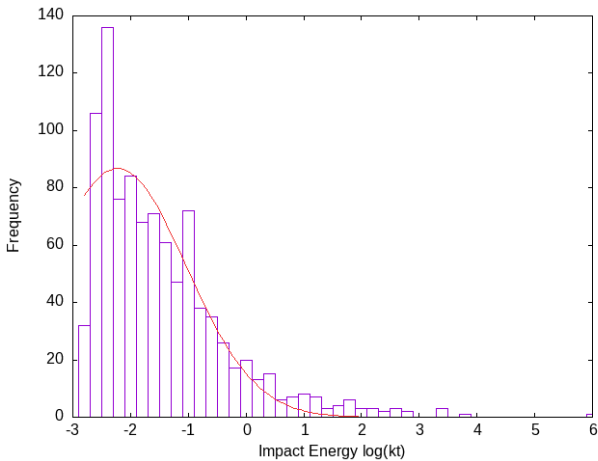


Figure 2

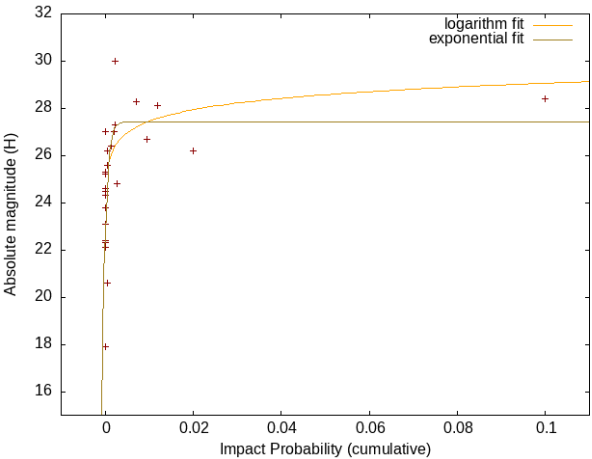


Figure 3

Discussion

References

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