

(12753) POVENMIRE-STANDARD COMPARISON SMALL MAIN BELT ASTEROID? Bruce Gary and Hal Povenmire 5320 E. Calle Manzana Hereford, AZ 85615 and Florida Institute of Technology 215 Osage Drive Indian Harbour Beach, FL 32937

In astronomy we need standard comparison objects. For quasars we use 3C-273. For galaxies, we compare to Andromeda or the Milky Way. For supernova we use the Crab. For stars we often use the Sun or Vega. For Planets we use Jupiter or Earth. For comets we compare to Halley. For the large asteroids, we compare to (1) Ceres. For the smaller main belt asteroids (SMBA) we do not have a standard comparison object. This abstract proposes (12753) Povenmire as it is close to the average or mean in all characteristics.

The small main belt asteroids (SMBA) have similar characteristics. Asteroid (12753) POVENMIRE has nearly all the average characteristics of an 18 km diameter main belt asteroid.

Physical and Orbital Parameters of Asteroid (12753) Povenmire:

The inclination is 14.79845°. This is almost exactly the mean.

The perihelion is 2.238 A.U.'s, the inner part of the main belt.

The aphelion is 3.010 A.U.'s, the outer part of the main belt.

The eccentricity is 0.1475941. This is near the mean eccentricity for SMBA.

The orbital period is 4.256874 years. This is almost exactly the mean for this group.

The rotation period of (12753) is 12.8544 hours. The average rotation rate for very small main belt asteroids is 7.3 hours. However, this is within .25 standard deviation for the larger SMBA.

The albedo is very near 0.5. Approximately 75% of SMBA have a very dark surface (deep red) indicative of a carbonaceous chondrite. This appears to be almost exactly the mean.

Essentially all SMBA have irregular shapes and surfaces. The amplitude of this SMBA has a magnitude fluctuation of .2 magnitude. This would indicate a potato shape but not a binary object. A ratio of 1:1.6 in length to width would account for this variation which would be about average. Probably about 20% of SMBA are binary.

The mean specific gravity of SMBA are approximately 2.8. This would indicate that the total mass of (12753) would likely be similar to the combined masses of Phobos and Deimos, the moons of Mars.

With all the new discoveries being made of minor planets, exceptions to the norm will be common. By having a standard comparison object, as a benchmark, the degree of strangeness can immediately be put into perspective. This will be invaluable for statistical studies.

References: (1) Geherls, T. (1982) Asteroids University of Arizona Press Tucson, AZ (2) Binzel, R., Gehrels, T., and Matthews, M.S. (1989) Asteroids II University of Arizona Press Tucson, AZ. (3) Schmadel, Lutz D. (2003) Dictionary of Minor Planet Names 5th Ed. Springer-Verlag New York, NY.