NEW IMPACT RISK SCALE FOR POTENTIALLY HAZARDOUS OBJECTS (PHO)

Wolfgang Wittholt
D-26131 Oldenburg,0049441507010, BasE-SC@t-online.de

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ABSTRACT

Up to now the classification of PHO is carried out by the Torino Scale and more specific by the Palermo Scale. But there is not included the decreasing time until the potentially impact. Examples are the asteroids 2006QV89 and (29075) 1950DA, listed in the ESA-Riskpage (http://neo.ssa.esa.int/risk-page, 2018-12-11).

2006QV89 has for the impact date 2019-09-09, in a few months, the probability of 1/11428 and the Palermo Scale rating is -3.79. It‘s diameter is estimated with 40 meter. So if it is an iron asteroid the impact may be similar to the impact of the Barringer Asteroid – in just a few months. Only the probability of 1/11428 protects us. This scenario can not be seen in the Palermo Scale rating of -3.79.

On the other side the asteroid (29075) 1950DA with a diameter of 2000 meter, which will impact in the year 2880 with a probability of 1/7042, has the Palermo Scale rating -1.36. His score is much higher than the score of 2006QV89 because of his estimated impact energy. But the aspect of remainig time to the impact is not considered by the Palermo Scale.

For (29075) 1950DA there is time for decades and centuries, to begin to act and to track the orbit more exactly, so that the probability can be determined better. For 2006QV89 it is much to late, to start a deflection mission. This is the motivation of this paper, to propose a new rating scale for PHO.

This new rating scale depends not only on the probability and the impact energy (roughly estimated by the diameter), it depends also on the remaining time up to the possible impact. The goal of this new rating scale is to give a suitable score for necessary action in the protection process.

In this paper a method of calculation of the score for a new rating scale for PHO is introduced and put up for discussion, so that the need and the demand of action in the protection process is represented in this score.