A METHOD TO EVALUATE THE IMPACT PROBABILITIES OF A COMETARY POPULATION WITH TERRESTRIAL PLANETS. H. Rickman [1,2], R. Gabryszewski [2], P. Wajer [2], T. Wiśniowski [2], [1]Dept. of Physics and Astronomy, Uppsala University, Box 516, SE-75120 Uppsala, Sweden, E-mail: Hans.Rickman@fysast.uu.se, [2]Space Research Centre Polish Academy of Sciences, ul. Bartycka 18A, 00-716 Warszawa, Poland.

Abstract: We present a two-step method of impact probability estimations between a cometary population and terrestrial planets. The idea is to find first the chance of impact per orbit as a function of orbital elements of the potential impactor and then perform the long term simulations of orbital evolutions with the use of cloning technique. The method will be applied to the modeling of small bodies dynamics during and after the LHB and should allow to conclude on water delivery and climate changes on Mars and effects on other terrestrial planets and Moon.

The poster presents the model and results for the first step of the method. We decided to examine 3-body system with comets on keplerian orbits due to massive numerical effort which had to be done. Gravitational perturbations from a planet were not included because their influence on probability values were statistically insignificant.

The computations allowed us to create maps of the collisional probabilities in a function of cometary perihelion distances and inclinations for Earth and Mars. Comparison to previous results were also attached.