

SPACE EXPLORATION SYMPOSIUM (A3)

Poster Session (P)

Author: Dr. Nataliya Kovalenko

Taras Shevchenko National University, Astronomical observatory, Ukraine, kievplanet@ukr.net

Mr. Rustam Guliyev

Shemakha Astronomical Observatory, Ukraine, rustamdb@gmail.com

Dr. Klim Churyumov

Taras Shevchenko National University, Astronomical observatory, Ukraine, klimchur@ukr.net

LONG-TERM DYNAMICAL EVOLUTION OF CENTAURS AND DAMOCLOIDS POPULATIONS

Abstract

We present the results of dynamical evolution modeling of Centaurs and Damocloids populations, according to orbital integration for 1 Gyr forward and backward in time from the present. There are 118 Centaurs currently known with $q > 5.2$ AU, $Q < 30$ AU, in a space between Jupiter and Neptune. It is believed there is a dynamical connection between Centaurs and Jupiter family comets, both having Tisserand invariant $T_j > 2$. Damocloids move along highly inclined orbits (some of them are on retrograde orbits), and have Tisserand invariant $T_j \leq 2$. Damocloides are believed to be transitional population between Oort cloud cometary nuclei and Halley type comets (those also have Tisserand parameter $T_j \leq 2$), or inactive nuclei of Halley type comets. There are 93 Damocloids currently known. The SWIFTER integrator package was used. The dynamical lifetimes for both populations were estimated. General results of the simulation for different orbital parameters and interesting paths for individual objects are discussed.