NEOs Experimental Study: Conventional Missions and Nuclear Thrust Experiments

V.A. Simonenko
Russian Federal Nuclear Center
All-Russia Scientific Research Institute of Technical Physics
Chelyabinsk-70, Russia

The great value for future Space Protection of the Earth (SPE) system will have the long-time exploratory program for direct experimental study of various types of NEO's properties of each object as a whole and of matters constituent of them. Two types of programs for possible space experiments are analyzed. The first one (conventional missions includes flyby, rendezvous, landing, sampling and fly back. The second type consists of exploration of nuclear explosive influence upon the chosen space bodies. Possible programs for both types of experiments are discussed.

The experiments will be targeted on the exploration of near-Earth asteroids (Atons, Appollons and Amours - AAA-objects -AAAO) and those asteroids from the basic belt that may be classified as representative for AAAO. The definite value may have "short-distance missions" to close frequently flyby small asteroids within several distances to the Moon.

Strategy for organization of possible experiments with nuclear pulsed influence upon NEOs is presented. Merits and difficulties of such the program are discussed. Several possible programs for separate nuclear pulsed thrust space experiments are analyzed. Environmental aspects for these experiments are discussed.

The direct NEO's space experimental program should be international. It is advisable to have the International coordinating Center for the program to ensure solving of economic, technical and organizational problems. Great attention has to be devoted to political, social and educational issues. All these aspects are briefly discussed.

The direct NEO's space experimental program will be virtually as an immediate verification of the future Space Protection of the Earth (SPE) system.