

## **SOLVING THE INTERNATIONAL SPACE STATION (ISS) MOTION CONTROL LONG-TERM PLANNING PROBLEM**

***V.N. Jukov, E.K. Melnikov, A.I. Smirnov***

*Mission Control Center, Central Research Institute of Machine Building,  
Pionerskaya st., 4, Korolev, Moscow Region, Russian Federation, e-mail: [nmi@mcc.rsa.ru](mailto:nmi@mcc.rsa.ru)*

Ballistic support of the orbital space stations long-term functioning at the altitudes up to 400 km provides not only for periodic altitude maintenance but also for the rather rigid orbital requirements fulfillment.

Space station flight ballistic condition forming is caused by necessity of the optimal guidance conditions providing for the transport vehicles, approaching to the station, and Russian crew transport vehicles landing to the given regions.

According to the international status of the ISS, the ballistic flight conditions for the international partners visiting vehicles must be taken into consideration when planning the orbit corrections. Research has shown that separate orbit forming for each ISS flight program operation results in higher fuel consumption for the station orbit maintenance, probable altitude constraints violation and visiting vehicles missions schedule violation. It causes the need in solving of the ISS motion control long-term planning problem, which is characterized by the maneuver schedule time-span of several months and several ISS orbital requirements for different moments of time.

The present report is devoted to the method for solving the ISS motion control long-term planning multi-purpose problem.