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DETERMINATION OF OPTIMAL POSITION OF "ION BEAM SHEPHERD" WITH RESPECT TO SPACE DEBRIS OBJECT

The work aim of the work is to solve the problem of finding an optimal position of a shepherd with respect to a target in terms of forces transmitted by the ion beam. The minimized efficiency function is derived taking into account the effectiveness of the mission to remove actively space debris within the concept of the Ion-Beam Shepherd. The information about the contour of the central projection of the target is proposed for determining the efficiency-function vector components of the force transmitted by a plume of the electric thruster. The optimal position of the shepherd for a given attitude position of the target is found numerically using the pattern search method. The results can be used to control the relative motion of the shepherd-target system.

Keywords: *active space debris removal, transmitted force, ion beam, target, optimal position, contour of central projection.*

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