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DYNAMICS AND CONTROL OF LARGE DEBRIS IN TETHER DRAG DEORBETING

Abstract

Among the technical methods of deorbiting, the concept of tether drag deorbiting with chemical propulsion has gradually become an active area of research in the field. In the debris removal, a based satellite is linked with large debris by a tether, constituting a tethered system; then, large debris is transferred and towed into a parking or graveyard orbit. This technology is an effective method for space environment maintenance. In tether drag deorbiting, attitude motion of large debris directly affects the flight safety of tethered system. In this paper, based on the model of tethered system with chemical propulsion, dynamic characteristics of large debris are analyzed. In order to eliminate the rotation of large debris, combined with orbit control of based satellite, a tension based control method is proposed, which belongs to a control problem with fixed point force vector constraint.