



SYMMETRIC REDUCTION AND HAMILTON-JACOBI EQUATION OF RIGID SPACECRAFT WITH A ROTOR

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Abstract. In this paper, we consider the rigid spacecraft with an internal rotor as a regular point of reducible regular controlled Hamiltonian (RCH) system. In the cases of coincident and non-coincident centers of buoyancy and gravity, we give explicitly the equations of motion and Hamilton-Jacobi equations of reduced spacecraft-rotor system on the symplectic leaves by calculation in detail, which show the effect on controls in regular symplectic reduction and Hamilton-Jacobi theory respectively.

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1. Introduction

It is well-known that the theory of controlled mechanical systems is an important subject in the recent years. It gathers together some separate areas of research such