

Stabilization of Rotational Motion of Spacecrafts Using Quantized Two Torque Inputs Based on Random Dither

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Abstract : The control problem of underactuated spacecrafts has attracted a considerable amount of interest. The control method for a spacecraft equipped with less than three control torques is useful when one of the three control torques had failed. On the other hand, the quantized control of systems is one of the important research topics in recent years. The random dither quantization method that transforms a given continuous signal to a discrete signal by adding artificial random noise to the continuous signal before quantization has also attracted a considerable amount of interest. The objective of this study is to develop the control method based on random dither quantization method for stabilizing the rotational motion of a rigid spacecraft with two control inputs. In this paper, the effectiveness of random dither quantization control method for the stabilization of rotational motion of spacecrafts with two torque inputs is verified by numerical simulations.

Keywords : spacecraft control, quantized control, nonlinear control, random dither method

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