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THE DESIGN OF A SATELLITE WITH A STRUCTURE OF RUBIK'S CUBE

Abstract

The paper designs a satellite with a structure of Rubik's cube. The satellite's different systems are encapsulated in separated modules of a $N*N*N$ Rubik's cube with standard interface of construction, electricity, thermal control etc.. For instance, a $3*3*3$ Rubik's cube satellite contains 6 central modules, 12 edge modules and 8 corner modules, whose structures differ with each other. With driving equipments, the satellite's modules can rotate to different locations, which changes the direction of elements' surface. For some equipments with stringent directivity such as optical equipments, antennas, the Rubik's cube satellite can fit the requirements on the condition that the satellite's attitude changes a little. In addition, each surface of the satellite's modules is designed independently with necessary thermal radiating properties. When the satellite is in orbit, the driving equipment can change the modules' orientation so as to make the thermal control of the satellite adapt to complex thermal conditions.