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RUBIK'S CUBE SATELLITE

Abstract

With the rapid expansion of space missions, the traditional spacecraft design ideas will be continuously challenged. However, most of satellites, currently, are designed for only 1-2 missions, and the parts of a satellite inside and outside are relatively immobile. It's unable to meet the needs of flexible multitask in the future.

Rubik's Cube (originally called "Magic Cube") is an intellectual toy, which is popular among teenagers even adults. It was invented by Professor Rubik in 1974. Each part of the cube is able to move and rotate. Thus, the Rubik's cube can be transformed. This toy may show us a new concept in satellite designing area to meet the needs mentioned above.

This paper presents a new satellite design concept referenced to Rubik's cube. The Rubik's cube satellite is able to transform itself by changing the position and direction of cube units. The concept gives a satellite multiple kinds of possibility, so that a satellite can take more payloads, have more functions, perform more types of missions, and avoid more risks from space environment. This paper presents an overall project of Rubik's cube satellite, which is made up of platform cube units and variable cube units. Two transform methods are discussed. One method is based on electromagnetic suspension, the other one is transformed by separate, transform and aggregate.

The Rubik's cube satellite is not a kid's toy flying around the earth. This new designing concept discussed may lead us to a new stage, it will satisfy more demand of the space missions in the future, just like those transformers in the movie.