

Small Satellites (13)

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Author: Mr. Bin Wang

Beihang University (BUAA), China, binw502@126.com

Mr. Jikui Liu

Beijing Institute of Control Engineering, China Academy of Space Technology (CAST), China,  
sadabjlk@sina.com

## CONCEPTUAL DESIGN AND IMPLEMENTATION OF ELECTRIC SAIL DEPLOYMENT MECHANISM

### **Abstract**

The paper introduced an electric sail (E-sail) deployment mechanism (EDM) used in a nano-satellite as well as ground test on it. First, the concept of E-sail and its application is presented. There are two feasible methods to deploy the E-sail: the mechanism rotation method and satellite rotation method. Analysis result under atmosphere and gravity shows that the mechanism rotation method could not entirely deploy the E-sail and is likely to cause attitude control difficulty on orbit. Then the design solution using the satellite rotation method is described in detail and a prototype is made. Finally test on the prototype is discussed and the results show that the EDM designed could deploy the E-sail successfully and stably, without twisting and hooking during working process.