

16th IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND  
DEVELOPMENT (D3)Interactive Presentations - 16th IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE  
EXPLORATION AND DEVELOPMENT (IP)

Author: Mr. Dong Yang

Northwestern Polytechnical University; National Key Laboratory of Aerospace Flight Dynamics, China,  
ydong@mail.nwpu.edu.cn

Prof. Xiaokui Yue

Northwestern Polytechnical University, China, xkyue@nwpu.edu.cn

Prof. Yuan Jianping

National Key Laboratory of Aerospace Flight Dynamics, Northwestern Polytechnical University, Xi'an,  
China, jyuan@nwpu.edu.cn

Mr. Ming Guo

Shanghai Engineering Center for Microsatellites, Chinese Academy of Sciences (CAS), China,  
googlm@163.com

## THE NOVEL DOCKING MECHANISM DESIGN OF MODULAR SPACE ROBOT

**Abstract**

Abstract: The Modular robots which possess apparent advantages of changing their configuration have a broad application prospects in the field of on-orbit operation. The essence of reconfiguration is that modules implement disconnection and connection according with specific rules, which could change the overall topology configuration of modular space robot. Therefore, the docking mechanism plays an important role. In order to satisfy the demand of reconfiguration, a new type of spatial cam-claw docking system is designed. On account of the compact structure of the module, a space cam transmission scheme is proposed and detailed mechanical design is carried out. The operating principle of the whole docking system is interpreted and the carrying capacity are also analysed. According to the actual connection and the separation process, the motion simulation and related experiments is carried out. Final part is the summary and prospect.