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RESEARCH PROGRESS OF ON-ORBIT SERVICING TECHNOLOGY ON SPACE ASTRONOMY

Abstract

On-orbit servicing technology was a research hot topic for space science and application in recent years, and was paid high attentions in some countries. Firstly, on-orbit serviced payloads of space astronomy on space shuttle were reviewed, and on-orbit servicing developments were represented on Hubble telescope and International Space Station (ISS). Then, on-orbit servicing technology on space astronomy was researched with the astronaut, robotic manipulator and exposed facility according to these successful projects. Many conceptual studies had been proposed for a few years, so some history conceptions of on-orbit assembly on optical telescopes were described based on ISS. In addition, some conceptions of on-orbit assembly technology for large space telescope were analyzed and compared, and some frontier explorations on additive manufacturing of space telescope components were analyzed and looked into the future. What's more, space astronomy vision and possible research areas on Chinese Manned Space Station and space optical telescope were introduced and conceived. It is indicated that the on-orbit modular assembly of large telescope will be an inevitable trend of space astronomy with space robotic technology, and will greatly enhance the ability of astronomy observation.