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MANUFACTURING EXPERIMENTS ACHIEVEMENT SHARING IN MICROGRAVITY AND FUTURE PROSPECTS BY THE KEY LABORATORY OF SPACE MANUFACTURING TECHNOLOGY

Abstract

Space manufacturing technology was first proposed to solve the problem of storage of spare parts of the space station. With the human exploration of the universe from low orbit to deep space, in-space manufacturing has gradually become a strategic key technology to solve the problem of positioning and utilization of extraterrestrial resources and expand the ability of human survival and activity in extraterrestrial. The Key Laboratory of Space Manufacturing Technology of the Chinese Academy of Sciences, as the earliest Chinese scientific research institution in this field, has been facing the forefront of the international space manufacturing field, and is committed to studying the forming mechanism of materials in the special environment of space, space intelligent manufacturing equipment and extraterrestrial resource placement and utilization technology, and systematically solving the problem of the full link of space manufacturing materials and equipment. This paper focuses on a series of manufacturing technology experiments that the laboratory has completed in the microgravity environment, including polymer materials, ceramic materials, metal materials, etc., as well as the upcoming technology verification experiments on the Chinese Space Station for future in-orbit maintenance support and extravehicular applications. Finally, the future development direction of space manufacturing technology is discussed and looked forward to.

Key word: microgravity environment, space manufacturing technology, in-orbit maintenance, extravehicular applications