IAF MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
Facilities and Operations of Microgravity Experiments (5)

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REAL AND SIMULATED MICROGRAVITY PLATFORMS: THEIR INDIVIDUAL CAPACITIES, BENEFITS AND LIMITATIONS

Abstract

Gravity is always present on earth. However, the influence of gravity can be modified or compensated for. Real microgravity conditions which are short term and fast responding can be provided in drop towers, balloons, parabolic flights of aircraft or sounding rockets. To study long term effects of microgravity, human tended space laboratories have been used, such as the International Space Station. Scientists have developed various kinds of ground-based facilities and equipment to achieve the condition of functional weightlessness as a result of limited access to space laboratories. The simulated microgravity platforms are long term and slow responding which can be provided during bedrest (e.g. head-down tilt bedrest), water immersions, magnetic levitation, on clinostats, random positioning machines and even centrifuges. This comparative study gives a reviewed overview of currently known real microgravity and simulated microgravity environments and platforms, and demonstrates their individual capacities, benefits and limitations.