

MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
Microgravity Sciences Onboard the International Space Station and Beyond - Part 2 (7)

Author: Dr. Tian yuan Hu
Institute of Manned Space System Engineering, China Academy of Space Technology (CAST), China,
hutianyuan04011@126.com

Dr. Biao Yang
China, yangbiao@pku.edu.cn

Ms. Yi Tang
Institute of Manned Space System Engineering, China Academy of Space Technology; Nanjing University
of Aeronautics and Astronautics, China, tang_yimoon@sina.com

ESTIMATION AND ANALYSIS OF MICROGRAVITY ENVIRONMENT ON SPACE STATION

Abstract

The microgravity environment is a common description of the low-level acceleration state existed on space flight, classified into three major categories of disturbances: quasi-steady acceleration, oscillatory acceleration, and transient acceleration. This environment on space station has afforded a unique area for scientific and technological experiments. The estimation of microgravity level on space station is very significant for space station design. Given a space station with configuration of alphabet "T" and a total mass of around 100 ton, the magnitude and distribution of quasi-steady acceleration is estimated. It shows that the magnitude of quasi-steady acceleration is on the level of $1\mu g_0$, attributing mostly from the gravity gradient effect. The transient acceleration can reach the level of $1000\mu g_0$. The results are helpful for arranging the layout of scientific payloads and designing the flight model during the period of conducting microgravity experiments.