

Conceptual design for TANPOPO mission: astrobiology exposure and micrometeoroid capture

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TANPOPO in Japanese, dandelion, is the name of a grass whose seeds with floss are spread by the wind. We propose a mission of the analyses of interplanetary migration of microbes, organic compounds and meteoroids on ISS-JEM/EF. The mission is named for TANPOPO. In order to carry out the TANPOPO mission, ultra low-density aerogels and exposure aluminum plates are developed and will be exposed in space. Ultra low-density aerogels, which are used to capture micrometeoroid and debris, are the lowest density 0.01g/cc and are the highest performance in the world. The particles will be analyzed for mineralogical, organic and microbiological characteristics. To investigate the survival of microbes in space environment, exposure aluminum plates applied microbial cells to will be exposed without a window. Organic compounds are also exposed to evaluate the possible denaturation under the conditions. The aerogels and the plates will be installed in a few directions on ISS-JEM/EF and will be carried back a few times for about five years.