**Theme and objective:**

With the sharp increase of mission complexity and working time limit of spacecraft, it is very important for spacecraft to ensure the reliability and safety of space transmission mechanism during service. Compared with the transmission mechanism in the ground environment, the space transmission mechanism is affected by multi-dimensional environmental variables such as high vacuum, microgravity, alternating temperature field, micro-vibration and motion gap, and its failure mechanism and degradation process are quite different. However, the ground physical simulation cannot fully verify the actual situation of the space transmission mechanism, so it is necessary to build an online remaining useful life prediction and health management strategy based on artificial intelligence between the ground physical simulation, virtual digital simulation and the operation of spatial entities. Aiming at the research of complex degradation mechanism of space transmission mechanism, the construction of real-time online remaining useful life prediction model and the formulation of health management strategy, this special session aims to provide an exchange platform, show the latest innovative ideas in online remaining useful life prediction and health management of space transmission mechanism, and provide theoretical and technical support for predictive maintenance of space transmission mechanism.

Field:

Potential topics include but are not limited to the following:

Space transmission mechanism; Degradation mechanism under the influence of space environment; Online remaining useful life prediction; Predictive maintenance technology; Online state prediction; Artificial intelligence; Digital twins; Machine learning; Deep learning