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Radiation Fields, Effects and Risks in Human Space Missions (5)

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A NEW RADIATION PAYLOAD FOR A POLAR ORBIT: TEN-KOH SPACECRAFT

**Abstract**

During 2018, we anticipate the launch of Ten-Koh spacecraft into polar orbit about (about 600 km altitude and 93 degrees inclination) by JAXA-Japan. The spacecraft is being built by Kyushu Institute of Technology (KIT-Japan). The prime payload is a radiation detecting system SHARP-O (Solar and Heliospheric Assessment of Radiation Particles in Polar Orbit) that is being developed by Prairie View AM University in partnership with NASA-Johnson Space Center. This unit will carry three sets of CMOS sensors as charge particle detectors (CPD) and another three sets of tissue equivalent material to assess dose at skin level in near real-time. Also, we are incorporating a Lulin detector being developed by the Bulgaria Academy of Sciences (BAS) as part of our payload. While the entire payload will remain less than three kilograms and runs on a three watt power will have two way communication capabilities to receive and execute commands to change the data collection protocols on our payload through Ten-Koh spacecraft. Once the payload is operational, we expect radiation data and distribution as a function of altitude and latitude locations of the spacecraft over the processing orbit around the earth. Such measurements and comparisons with other data from the International Space Station (ISS) and other spacecraft measurements are expected to be complimentary. We expect the results will enable us to understand and characterize radiation environment in the polar orbit.