Deep Space ICCHIBAN:
An International Comparison of Space Radiation Dosimeters aboard the NASA Deep Space Test Bed

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NASA recently accepted a proposal submitted by the ICCHIBAN Working Group to carry out an ICCHIBAN experiment aboard the Deep Space Test Bed (DSTB). The purpose of the experiment is to intercompare the response of passive and active dosimeters to the deep space galactic cosmic radiation environment during a circumpolar flight of the balloon-borne DSTB. In addition to providing data necessary for the intercomparison of space radiation detectors and dosimeters from different laboratories, the Deep Space ICCHIBAN experiment furthers the goals of NASA's Exploration Systems Mission Directorate by providing results that can be used in the *in situ* validation in the deep space environment of radiation transport codes and environment models currently in use or being developed by NASA.

The Deep Space ICCHIBAN experiment hardware will consist of one or more experiment packages containing a large number (~15) of passive dosimeters—primarily thermoluminescent detector (TLD) and CR-39 plastic nuclear track detector (PNTD)—provided by research laboratories involved in space radiation dosimetry around the world. Active detectors will include the U. of Kiel DOSTEL Si telescope, the SwRI HETn particle telescope, and the two active detectors—a Shuttle-style TEPC and the Liulin-4 MDU—included in the DSTB standard instrument suite. All experiment hardware with the exception of the Shuttle-style TEPC and Liulin-4 MDU will be provided by the ICCHIBAN working group and the participating laboratories. Passive dosimeters will be contained in a pressurized tray, which is attached to the DSTB gondola prior to launch of the balloon. Following recovery, the experiment packages will be detached from the DSTB gondola and returned to the ICCHIBAN Working Group for disassembly and distribution to the participating laboratories. The participating laboratories will then process, readout and analyze their detectors and report their results to the ICCHIBAN Working Group. Data from active detectors will be downloaded via DSTB telemetry channels for analysis both during and after the mission.

The first opportunity to conduct a Deep Space ICCHIBAN flight will be in Summer 2006 during a DSTB flight from Sweden to Western Canada/Alaska and will likely consist of only passive detectors and the Liulin-4 MDU. A second opportunity in Antartica and would consist of the full compliment of active and passive detectors. For purposes of this talk, the radiation environment encounterd during the Deep Space ICCHIBAN flight is illustrated using measurements made aboard previous high altitude, circumpolar balloon missions. The ICCHIBAN Working Group and the Deep Space Test Bed project at Marshall Space Flight Center welcome the participation of all laboratories who have previously participated in ICCHIBAN experiments.