PREPARATION AND CURRENT SITUATION OF PROTON-ICCHIBAN-2 EXPERIMENT

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The ICCHIBAN (Inter Comparison for Cosmicrays with Heavy Ion Beams at NIRS) working group has organized and performed various ICCHIBAN runs for active and passive radiation detectors at HIMAC, NIRS, Japan, Loma Linda and Brookhaven, USA and CERN, Switzerland since the start of the ICCHIBAN project in the year 2002. One of the main focus points of this project is to understand the response of the applied detector systems (either active or passive) for personal and area dosimetry in space environment to a simulated sub-set of the space radiation environment, focusing on the heavy ion response. This is of special importance for the further intercomparison of space radiation data gathered by various international institutes and universities for space radiation experiments as MATROSHKA, DOSIS, DOBIES, BRADOS, MATROSHKA-R etc. The ICCHIBAN experiments have created a big database of response data, especially for all the different passive radiation detectors and detector materials (Thermoluminescence (TLD) and Optical Luminescence (OSL)) over the last 7 years, resulting in a better understanding of how and why we still have differences in the measurement results from common space experiments – as the Space ICCHIBAN 2 experiment. One of the reasons
why for the differences in the TLD/OSL results is the lack of intercomparison and response
data for low LET particles up to around 10 keV/m, especially protons. Due to the fact, that
the main contribution to absorbed dose in low earth orbit is due to protons, the ICCHIBAN
working group has started the set-up of a Proton ICCHIBAN intercomparison experiment at
NIRS. The Proton ICCHIBAN run has been performed at the cyclotron at NIRS, Chiba in
February 2010. 15 institutes from 12 countries sent or brought their dosimeters and exposed
them to 40 and 70 MeV proton beams with the same doses and exposure conditions. In this
paper, the experiment procedures and current situation of the intercomparision experiments
will be shown.