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Summary of Medipix Technology's 3-Years in Space and Plans for Future Developments

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NASA has evaluated 7 Timepix-based radiation imaging pixel detectors from the CERN-based Medipix2 collaboration on the International Space Station (ISS), collecting 3-years of data, as well on the recent EFT-1 mission testing the new Orion Multi-Purpose Crew Vehicle. These data along with data collected at ground-based accelerator facilities including the NASA Space Radiation Lab (NSRL) at Brookhaven in the US, as well as at the HIMAC facility at the National Institute for Radiological Sciences in Japan, have allowed the development of software analysis techniques sufficient to provide a stand-alone accurate assessment of the space radiation environment for dosimetric purposes. Recent comparisons of the performance of the Timepix with both n-on-p and p-on-n Si sensors will be presented.

The further evolution of the Timepix technology by the Medipix3 collaboration in the form of the Timepix3 chip, which employs a continuous data-driven readout scheme, is being evaluated for possible use in future space research applications.

The Medipix2 Collaboration is also in the process of designing an updated version of the Timepix chip, called the Timepix2, which will continue the frame-based readout scheme of the current Timepix chip. Current plans are to replace the Timepix by the Timepix2 with minimal reconfiguration of the supporting electronics. Longer-term plans include participation in the currently forming Medipix4 collaboration. A summary of the prospects will be included.

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