

New Pico Event Timer for space applications

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We report on the concept, design, and tests of a New Picosecond Event Timing (NPET) device and its response to the radiation dose. These radiation tests were aimed to verify that the existing version of the NPET device may be used in space missions. The device was subjected to radiation of a total dose of 74 Gy provided by a ^{60}Co source. This radiation dose did not affect the epoch timing part of the device. After irradiating the device with the final radiation dose, a single measurement resolution is better than 0.9 ps. The overall timing stability characterized by Time Deviation is better than 5 fs for 100 s. The completed device tests and results indicate the possibility of using the existing New Pico Event Timing device electronics version for a space mission in which the total radiation dose will not exceed 74 Gy value. Presently a new version of the NPET device is under development. The goal is to modify its mechanical design to be suitable for space application and to integrate the pulse signal input logic into the main board. The newly developed version of the device is expected to be applicable in the laser time transfer mission in the space segment.