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Time performances and irradiation test of CsI crystals readout by MPPC

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As an alternative of the crystal choice for the Mu2e calorimeter, we have tested single crystals of pure CsI in combination with large area MPPC from Hamamatsu. The MPPC under consideration, consisting of an array of $16 \times 3 \text{ mm}^2$ cells, $50 \text{ }\mu\text{m}$ pixels, grants an active area of $12 \times 12 \text{ mm}^2$ and has an improved PDE reaching $\sim 40 \%$ down to 250 nm thus well adapting to the emission spectra of these crystals. We have measured the light yield, the longitudinal response uniformity and the time performances of CsI crystals procured from three different firms. We have also determined their radiation hardness to a ionization dose of up to 100 krad and to a neutron flux of up to 10^{11} n/cm^2 .

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