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Ultrafast Inorganic Scintillators for future HEP and Imaging Applications

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Heavy inorganic scintillators, such as LYSO:Ce, is currently used to construct the CMS Barrel Timing Layer aiming at 30 ps time resolution for the HL-LHC. Ultrafast inorganic scintillators, such as BAF2:Y, has been proposed for ultrafast calorimeter and GHz hard X-ray imaging. In this investigation, we report temporal response of ultrafast inorganic scintillators with ultrafast decay time, such as BaF2, BaF2:Y, Cs2ZnCl4, Ga2O3, Lu2O3:Yb, YAP:Yb, YAG:Yb and ZnO:Ga etc. Potential application for ultrafast timing, tracking and imaging will also be discussed.

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