Supplementary Information

Oxide Lu_2TeO_6 single crystal for X-ray detection with ultralow detection limit

Tingting Cao, Feifei Guo, Fuai Hu, Xutang Tao, Zeliang Gao* *

State Key Laboratory of Crystal Materials and school of Crystal Materials, Shandong University, Jinan, 250100, China

Email: gaozeliang@sdu.edu.cn (Zeliang Gao)

Email: guofeifei@mail.sdu.edu.cn (Feifei Guo)

1. Supplementary figures

Figure S1 Photograph of the as-grown Lu_2TeO_6 single crystal.

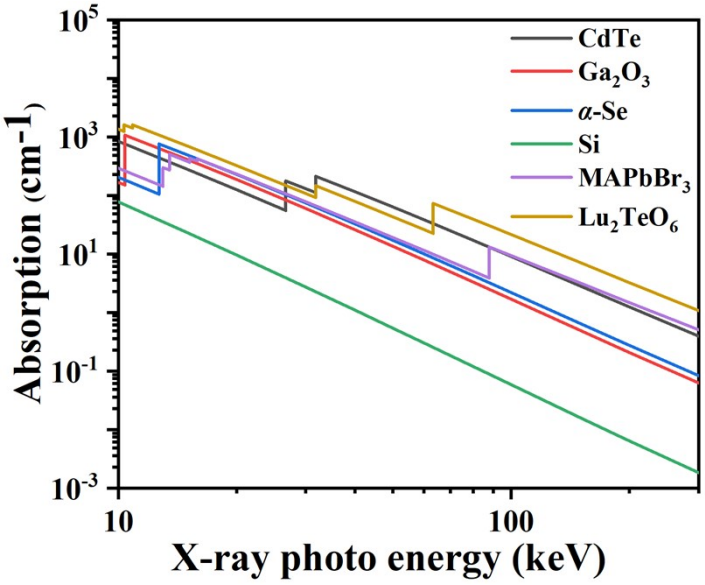

Fig. S2 The X-ray absorption coefficients of Lu_2TeO_6, CdTe, Ga_2O_3, α-Se, Si, and $MAPbBr_3$.

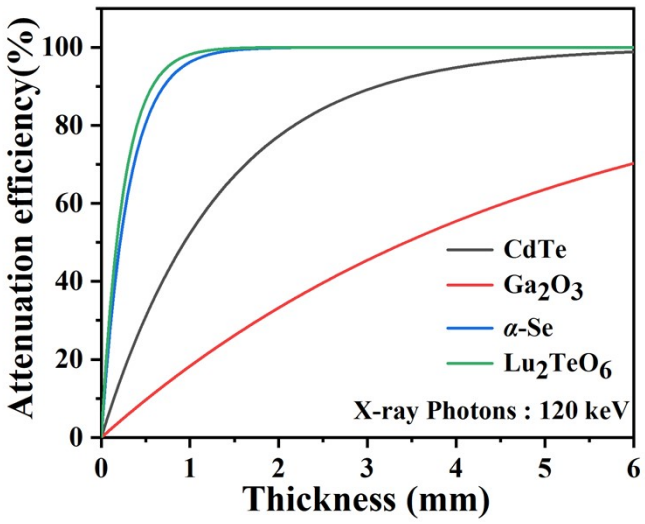

Fig. S3 The thickness dependent attenuation efficiency of Lu_2TeO_6 to 120 KeV X-ray photons.

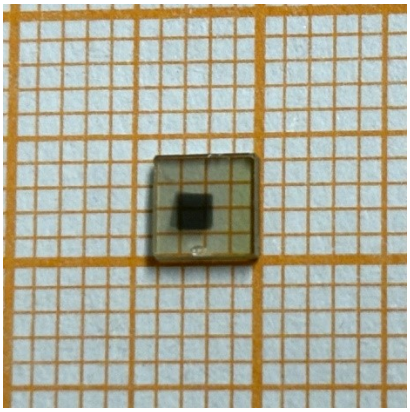

Fig. S4 Photograph of the Lu_2TeO_6 X-ray detector with Au/ Lu_2TeO_6/Au electrode structure.

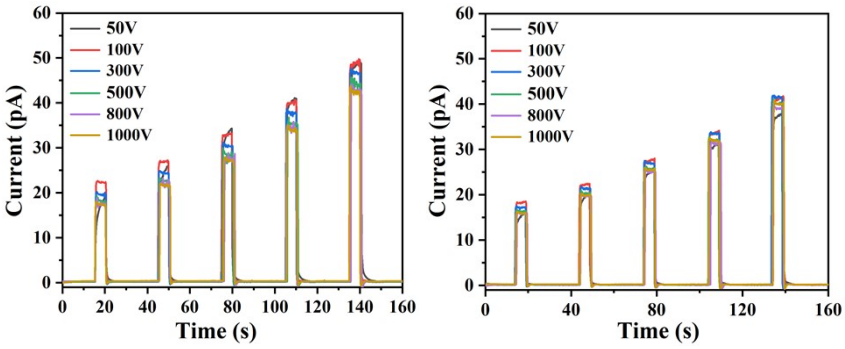

Fig. S5 Temporal X-ray responses of the device based on the (100) (left) and (001) (right) wafers under voltages from 50 V to 1000 V at 40 keV.

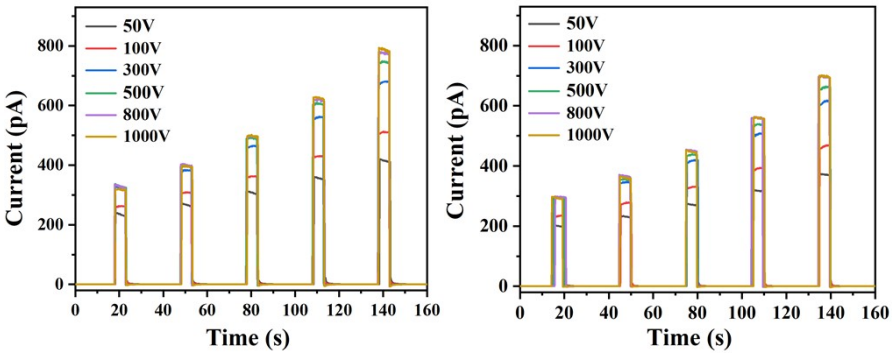

Fig. S6 Temporal X-ray responses of the device based on the (100) (left) and (001) (right) wafers under voltages from 50 V to 1000 V at 120 keV.

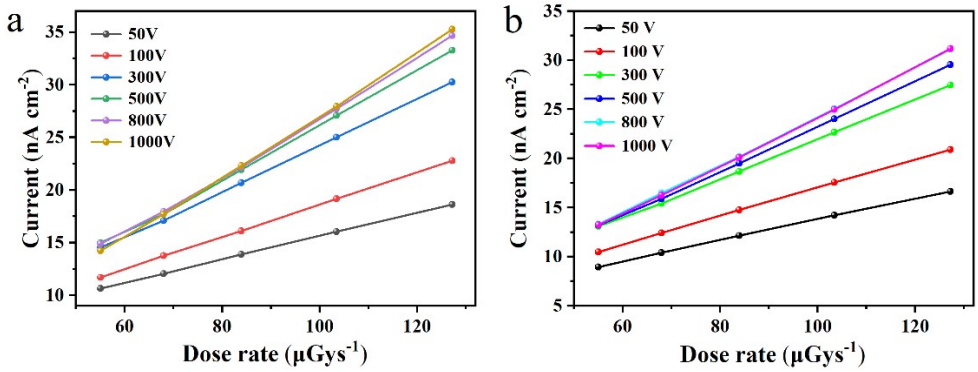

Fig. S7 Photocurrent response at different biases under 120 keV X-ray various dose rates of the (a) (100) and (b) (001) detectors.