



## Effect of $\gamma$ -radiation on HfO<sub>2</sub> based MOS capacitor

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### Abstract

Radiation effects on Metal Oxide Semiconductor (MOS) capacitors with a HfO<sub>2</sub> gate insulator have been studied. Because HfO<sub>2</sub> is a promising high-k dielectric material for microelectronic applications, radiation effects on its performance in MOS devices is of interest. New results on radiation effects on HfO<sub>2</sub>, particularly at low gamma radiation doses, are presented. The results are compared with other systems including those of Al<sub>2</sub>O<sub>3</sub> plus silicon based Si MOS capacitors. Both devices with different gate thicknesses were irradiated with Co-60 gamma source for varying exposure time. The midgap and flatband voltage shifts in these devices were measured and analyzed. Results show that gamma radiation does not cause significant variations in the HfO<sub>2</sub> MOS especially at low doses.