

**THE EFFECT OF TiO<sub>2</sub> THIN FILMS ON THE SENSITIVITY, REPEATABILITY AND CURRENT DENSITY OF THE DIELECTRIC BOLOMETER Ba<sub>0.6</sub>Sr<sub>0.4</sub>TiO<sub>3</sub> AS A DISTANCE SENSOR**

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**ABSTRACT**

Sol-gel method has been used for the preparation of titanium as a buffer layer in the dielectric bolometer Ba<sub>0.6</sub>Sr<sub>0.4</sub>TiO<sub>3</sub>. The TiO<sub>2</sub> films were prepared onto RuO<sub>2</sub>/SiO<sub>2</sub>/Si substrate and annealed at various temperatures. The X-ray diffraction (XRD) results showed that TiO<sub>2</sub> thin film annealed at 300 and 350°C were amorphous, and transformed into the anatase form at 400 °C, and mix phase between anatase and the brookite phase at 450°C. The field emission scanning electron microscope (FE-SEM) results showed that the grain size of TiO<sub>2</sub> thin films increased as the temperature increased. All the sensitivity, repeatability and current density of the sensors decreased with the increased grain size of TiO<sub>2</sub> thin films after annealed above 350°C. Our result shows that all of the sensors except sensor with TiO<sub>2</sub> film annealed at 550°C can act as a sensor even though without the IR source.

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