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STRUCTURAL, MORPHOLOGICAL AND 1/f NOISE PROPERTIES OF ITO/TiO₂ THIN FILMS BY e-BEAM EVAPORATION SYSTEM FOR OPTOELECTRONIC DEVICE APPLICATIONS**V. Manjunath,^{1*} D. V. Sowmya,² K. Murali Mohan Achari,² P. Sandhya,² G. Sravya,⁴ P. Ananda,³ and M. Krishnaiah¹**

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Abstract. The present research study, ITO/TiO₂ thin films are prepared on glass substrate by using e-beam evaporation system at different annealing temperatures (300, 350, 400 and 450 °C). The amorphous and crystalline natures of ITO/TiO₂ structure was analysed by X-ray diffraction study. As the grain size becomes larger, indirectly it will develop the crystalline quality of the TiO₂ films studied from AFM. The surface of TiO₂ films and the crystallite size of the sample are increased gradually with respect to temperature which is observed in SEM. The elemental composition determined by the energy dispersive analysis of EDAX showed that TiO₂ thin films were highly stoichiometric. The grain size and average slope of 1/f noise were increased with an increasing annealing temperature. Further, the higher optical transmittance (~93%) was obtained with 450 °C annealed ITO/ TiO₂ film. The optical band gap was increases corresponding annealing temperatures (300, 350, 400 and 450 °C). All the above results of this present work can be utilized for solar cell and optoelectronic device applications.