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Manganite – Semiconductor Bilayers: For Device Applications

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We report the synthesis of manganite-based nanostructured thin film heterostructures synthesized using pulsed laser deposition system. In these bilayers, manganites were used as one of the layers and another layer was a wide-band gap semiconductor system. The growth parameters were so chosen that the films had nanostructured assembly. We have also studied the substrate-dependent properties of the bilayer. This study has been facilitated by optical, structural and transport studies. The systems described here are $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ and $\text{La}_{0.7}\text{Ba}_{0.3}\text{MnO}_3$ thin films bilayered with SnO_2 . The properties exhibited by these bilayers can be explored as simple electronic components such as diode-like (non-linear response), resistive like (linear response) and resistance-switching devices; which project the efforts in non-conventional device category.