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Single crystal complex oxide on flexible substrate. SAIDUR BAKAUL, CLAUDY SERRAO, OUKJAE LEE, SAYEEF SALAHUDDIN, University of California Berkeley — Flexible ferroelectrics are needed for various applications such as biocompatible energy harvesting and flexible memory. In this sector, most of the current research is focused on organic piezoelectric materials which have advantage of flexibility but suffers severely from poor energy conversion and generation efficiency. On the contrary, owing to very high electromechanical coupling factor (representing energy conversion efficiency) complex oxides are the best choices as energy harvesting and transduction elements, especially for transforming mechanical energies into electronic energy. Still their usage in energy harvesting is very limited mainly due to the stringent growth conditions of single crystals, high temperature needed for crystallization and lack of flexibility and stretchability. We have shown that single crystal $Pb_{0.8}Zr_{0.2}TiO_3$ can be epitaxially transferred on flexible plastic substrate. The transferred PZT shows 70 uC/cm^2 remnant polarization and dielectric constant over 100 even when it is bent. These results suggest the possibility of single crystal complex oxide devices on flexible platform.

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