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Applications of interface controlled pulsed-laser deposited polymer films in field-effect transistors[1] DANISH ADIL, NDUBUISI UKAH, SUCHI GUHA, Department of Physics and Astronomy, University of Missouri, Columbia, MO 65211, RAM GUPTA, KARTIK GHOSH, Department of Physics, Astronomy, and Materials Science, Missouri State University, Springfield, MO 65897
— Matrix assisted pulsed laser evaporation, a derivative of pulsed laser deposition (PLD), is an alternative method of depositing polymer and biomaterial films that allows homogeneous film coverage of high molecular weight organic materials for layer-by-layer growth without any laser induced damage. Polyfluorene (PF)-based conjugated polymers have attracted considerable attention in organic field-effect transistors (FETs). A co-polymer of PF (PFB) was deposited as a thin film using matrix assisted PLD employing a KrF excimer laser. Electrical characteristics of FETs fabricated using these PLD grown films were compared to those of FETs using spin-coated films. We show that threshold voltages, on/off ratios, and charge carrier motilities are significantly improved in PLD grown films. This is attributed to an improved dielectric-polymer interface.

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