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Growth of ZnBeMgO films by pulsed laser deposition NEERAJ PANWAR, JOSE LIRIANO, VENKATA S. PULI, RAM S. KATIYAR, Department of Physics, Institute of Functional Nanomaterials, University of Puerto Rico, San Juan-00931, DEPARTMENT OF PHYSICS, INSTITUTE OF FUNCTIONAL NANOMATERIALS, UNIVERSITY OF PUERTO RICO, SAN JUAN-00 TEAM
— Band gap tailoring of ZnO with Be and Mg co-doping has proven important for the fabrication of a UV detector. For this purpose the deposition of good quality thin films is very essential. We have deposited Zn $_{1-x-y}$Be$_x$Mg$_y$O (x=0, 0.10; y=0, 0.10, 0.20) films on sapphire substrate by pulsed laser deposition. The films were deposited using a KrF excimer laser ($\lambda = 248$nm) with 250 mJ energy and repetition rate of 10Hz at a substrate temperature of 650 $^\circ$C and O_2 partial pressure 2mTorr. The films were further annealed at 800 $^\circ$C for 30 min with 200Torr O_2 pressure. X-ray diffraction studies revealed the polycrystalline nature of the films. For the band gap calculation, UV measurements were carried out and a blueshift was noticed. The cutoff wavelength for the pristine ZnO film was 370 nm which decreased to 240 nm for 10%Be and 20%Mg co-doped film. This value of $Zn_{0.7}Be_{0.1}Mg_{0.2}O$ film lies in the solar blind region and should be useful for the fabrication of solar blind UV detector. Other studies like morphological, Raman and I-V characteristics of these films are in process and will be presented in the meeting.

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