Preface

Mixed valent manganites based thin films, heterostructures and devices are becoming useful materials for different applications due their fascinating interrelated structural, microstructural, transport, magnetotransport, magnetic properties. Studies on manganite devices have opened up several exciting and interesting possibilities for research in condensed matter physics and their applications such as read-write heads, IR bolometers, field effect devices, field and temperature sensors etc. The delicate interplay between the kinetic and electrostatic energies of mobile charge carriers and their coupling to lattice and the strong coupling between spin, charge and lattice degrees of freedom in manganites, lead to a wide range of striking physical phenomena exhibited by them. The rectifying behavior of the manganite based p-n junction heterostructure depending on the temperature, magnetic field, thickness etc finds many applications in the p-n junction applicability as compared to the conventional p-n junction diodes. The variation in the saturation voltage (extracted from the I-V curves) with temperature, magnetic field and the thickness of the manganite results into some interesting puzzling positive MR property of the heterostructure. ZnO-Manganite based heterostructures were studied using various physical properties (mainly structure, microstructure, electrical transport, magneto transport etc). The ZnO-Manganite based p-n junction heterostructures were synthesized using PLD facility at UGC - DAE Consortium for Scientific Research, Indore, India. Most of the experimental tools of characterization at UGC - DAE Consortium for Scientific Research, Indore, India, has been used.