Stress-induced the enhancement of magnetoresistance in 
La0.75Ca0.25MnO3 thin films grown on Si (100) substrates

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We witnessed the enhancement of magnetoresistance (MR) in La0.75Ca0.25MnO3 thin films 
grown on Si (100) substrates by RF magnetron sputtering. The films are polycrystalline with (100) 
and (110) orientations. The lattice constants of films are reduced as much as 0.9% compared to the 
one of the bulk sample, which proves that the compressive stress on films was imposed by Si 
substrate. It is found that the MR value \((\Delta \rho / \rho_0)\) of films are 0.33, 0.29 and 0.27 under a magnetic 
field of 1.5T for each films with deposition temperature of 700°C, 750°C and 800°C, respectively. The 
correlation between the MR values and lattice constants of films is discussed. It is concluded that 
the compressive stress on films cause the enhancement of MR values of thin films grown on Si 
(100) substrates. Some mechanism of compressive stress induced by Si substrate is suggested.