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## Magnetic properties of LCMO deposited films

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### Abstract

La–Ca–Mn–O films were deposited with various thickness (500, 1000 and 1500°C) by RF-magnetron sputtering at 700°C and by the spin coating of sol–gel method at 400°C on LaAlO<sub>3</sub>(1 0 0) and Si(1 0 0) single-crystal substrates. The crystal structure and chemical composition of the film grown by RF sputtering method were orthorhombic and La<sub>0.89</sub>Ca<sub>0.11</sub>MnO<sub>3</sub>, respectively, while the film prepared by sol–gel spin coating was cubic with La<sub>0.7</sub>Ca<sub>0.3</sub>MnO<sub>3</sub>. The temperature dependence of the resistance for the film grown by RF sputtering method with the thickness of 1000°C shows that a semiconductor-metal transition occurs at 242 K. The relative maximum magnetoresistance is about 273% at 226 K. © 2002 Elsevier Science B.V. All rights reserved.

*Keywords:* Perovskite structure; Magnetoresistance; RF sputtering; Sol–gel method; Epitaxy

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