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Pressure induced metallization of ferromagnetic insulating Manganite BARNALI GHOSHAHA, A.K. RAYCHAUDHURI, S.N. Bose National Center for Basic Sciences, Kolkata 700098, India, S. ARUMUGAM, Bharathidasan University, Tiruchirapalli, India, N.R. TAMIL SELVAN, T. NAKANISHI, H. YOSHINO, K. MURATA, Osaka City University, Osaka, Japan, YA. M. MUKOVSKII, Moscow State Steel and Alloys Institute, 075 Leninsky Prospekt 4, Moscow 119049, Russia — Hole doped Manganites show a ferromagnetic insulating state (FMI) at low hole doping. The FMI state occurs at low temperatures and is distinct from the high temperature paramagnetic polaronic insulating state (PMI). The FMI state is also not a Charge ordered insulating state and shows absence of any colossal magnetoresistance. We report complete 2 stage metallization of the FMI state in the system hole doped manganite $\text{La}_{0.79}\text{Ca}_{0.21}\text{MnO}_3$ under hydrostatic pressure to a FMM phase with a paramagnetic metallic state. Beyond a pressure of 6GPa even the high temperature polaronic insulating state collapses to a metallic state. In the process of pressure induced metallization, in a certain pressure range, the material shows a coherence temperature where a highly resistive incoherent metal crosses over to a less resistive band type metal. The pressure induced metallic phase so created under has no appreciable magnetoresistance unlike colossal magnetoresistance seen in systems at higher hole concentration.

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