Abstract Submitted
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Pressure Effect on the Structural Transition and Suppression of the High-Spin State in the Triple-Layered T'-La4Ni3O8[1] J.-G. CHENG, U. Texas-Austin and ISSP, U. Tokyo, J.-S. ZHOU, J.B. GOODENOUGH, U. Texas-Austin, H.D. ZHOU, NHMFL, Tallahassee, K. MATSUBAYASHI, Y. UWATOKO, ISSP, U. Tokyo, P.P. KONG, C.Q. JIN, IOP, CAS, W.G. YANG, HPSync, ANL, G.Y. SHEN, HPCAT, ANL — We have carried out a comprehensive high-pressure study on the triple-layer T'-La4Ni3O8 with a suite of experimental probes, including structure determination, magnetic, and transport properties up to 50 GPa. Consistent with a recent ab inito calculation [1], application of hydrostatic pressure suppresses an insulator-metal spin-state transition at Pc $\sim$ 6 GPa. However, a low-spin metallic phase does not emerge after the high-spin state is suppressed to the lowest temperature. For P $>$ 20 GPa, the ambient T' structure transforms gradually to a T'-type structure, which involves a structural reconstruction from fluorite La-O2-La blocks under low pressures to rock-salt LaO-LaO blocks under high pressures. Absence of the metallic phase under pressure has been discussed in terms of local displacements of O2- ions in the fluorite block under pressure before a global T* phase is established [2]. Ref. [1] V. Pardo and W. E. Pickett, Phys. Rev. B 85, 045111 (2012). [2] J.-G. Cheng, et al. Phys. Rev. Lett. 108, 236403(2012).

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