

Abstract Submitted
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Spin and charge orderings in single layered cobaltate $\text{La}_{2-x}\text{Ca}_x\text{CoO}_4$ ($0.3 < x < 0.8$) KAZUMASA HORIGANE, HARUHIRO HIRAKA, TORU UCHIDA, KAZUYOSHI YAMADA, JUN AKIMITSU — Neutron scattering experiments were performed on single crystals of layered cobalt-oxides $\text{La}_{2-x}\text{Ca}_x\text{CoO}_4$ (LCCO) to characterize the charge and spin orders in a wide hole-doping range of $0.3 \leq x \leq 0.8$. For a commensurate value of $x=0.5$ in (H,0,L) plane, two types of superlattice reflections concomitantly appear at low temperature; one corresponds to a checkerboard charge ordered pattern of $\text{Co}^{2+}/\text{Co}^{3+}$ ions and the other is magnetic in origin. Further, the latter magnetic-superlattice peaks show two types of symmetry in the reflections, suggesting antiferromagnetic-stacking (AF-S) and ferromagnetic-stacking (F-S) patterns of spins along the c direction. From the hole-doping dependence, the in-plane correlation lengths of both charge and spin orders are found to give a maximum at $x=0.5$. These features are the same with those of $x=0.5$ in $\text{La}_{1-x}\text{Sr}_{1+x}\text{MnO}_4$ (LSMO), a typical checkerboard and spin ordered compound.

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