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Influence of edge state on magnetic entropy in manganitesnanodisks YANMEI WANG, JIAN SHAO, HANXUAN LIN, HAO LIU, YANG YU, Fudan Univ, JIRONG SUN, Chinese Academy of Sciences, WENBIN WANG, LIFENG YIN, JIAN SHEN, Fudan Univ, M03 TEAM, LOW DIMENSION COMPLEX PHYSICS COLLABORATION — The broken symmetry effect on CE type antiferromagnetic spin structure can lead to emerging ferromagnetic edge state in manganites systems. The edge state is expected to become more and more dominant with decreasing size of the system. In this work, we fabricate manganites nanodisks with changing diameters from epitaxial thin films to investigate how edge state affects the magnetic properties, in particular the magnetic entropy of the manganites systems. Our observe that with scaling down to the characteristic length scale of electronic phase separation(EPS), the $La_{0.325}Pr_{0.3}Ca_{0.375}MnO_3$(LPCMO) nanodisks undergo a transition from a EPS state featuring coexistence of ferromagnetic metal and charge ordering insulator phases to a single ferromagnetic metal state. The change of magnetic entropy upon this transition has been characterized by SQUID magnetometer revealing the effect of edge state on the spin ordering and thus the entropy of the system.

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