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Competing Magnetic Ground States in ASite Layer Ordered Manganites[1] B. DABROWSKI, O. CHMAISSEM, Physics Department, Northern Illinois University, DeKalb, IL 60115 and Materials Science Division, Argonne National Laboratory, Argonne, IL 60439, Y. REN, Physics Department, Northern Illinois University, DeKalb, IL 60115 and X-ray Science Division, Argonne National Laboratory, Argonne, IL 60439, D. E. BROWN, S. KOLESNIK, J. MAIS, Physics Department, Northern Illinois University, DeKalb, IL 60115 — We report the discovery of competing ground states near a multicritical point in A-site layer ordered $La_{1-x}Ba_{1+x}Mn_2O_6$ materials. We demonstrate the dual effects of deliberately introduced disorder on the system's stability, the freezing of the competing states, and the drastic reduction in magnetic fields required for the suppression of charge and orbital ordered phases. Our work suggests that quenched disorder is not the primary reason for phase separation and magnetoresistance, and that increased doping leads to electronic phase separation.

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