YUHAI QIN, TREVOR TYSON, New Jersey Institute of Technology, SANG-WOOK CHEONG, Rutgers University, XIAONONG XU, Nanjing University — The multiferroic BiMnO3 system, in which ferroelectric and ferromagnetic orders can coexist, has attracted much research work in the past years for its potential technological applications. For the more general system Bi1-xCaxMnO3, the phase diagram for the Ca rich region (x > 0.4) has been established [1]. In order to understand the multiferroic behavior near the x=0 system, the hole-doped region (0<x<0.5) was investigated. We have completed the magnetic, transport, and structural phase diagram of Bi1-xCaxMnO3, by performing detailed structural (XRD and XAFS), magnetization (ZFC/FC) and electrical measurements on Bi1-xCaxMnO3 (0<x<0.5), showing the transition form the highly distorted monoclinic phase to the orthorhombic phase. This work is supported by NSF DMR-0512196.