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Observation of fishtail effects in  $BaFe_{2-x}Ni_xAs$  single crystals YING ZI ZHANG, HI QIAN LUO, NLSC Institute of Physics, and Center for Condensed Matter Physics, Chinese Academy of Sciences — Isothermal magnetization loops were performed to characterize magnetic properties of three small chips of  $Bi_{2+x}Sr_{2-x}CuO_{6+\delta}$  single crystals in different temperatures, where x = 0.10, 0.12,0.14. All of the crystals show anomalous fishtail effects (second peak effects). We found that the second peaks can be described by thermal decoupling modal. The lowest crossover field from the first peak to the second peak is found as low as several Oe. We suggest that the crossover field is related to unbinding the vortex-antivortex pairs and building the vortex interaction from layer to layer.

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