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Vortex dynamics in Co-doped and K-doped $BaFe_2As_2$ with point defects TOSHIHIRO TAEN, TAKAHIRO OHORI, FUMIAKI OHTAKE, YASUYUKI NAKAJIMA, TSUYOSHI TAMEGAI, Department of Applied Physics, The University of Tokyo, KUNIHIRO KIHOU, SHIGEYUKI ISHIDA, HIROSHI EISAKI, National Institute of Advanced Industrial Science and Technology (AIST), HISASHI KITAMURA, Radiation Measurement Research Section, National Institute of Radiological Sciences — The discovery of iron-based superconductors urges scientists and engineers to study not only superconducting mechanism but also possible applications. In view of this situation, it is important to study vortex dynamics for understanding fundamental properties as well as for suggesting a suitable fabrication process in this system. In particular, the interaction between vortices and defects attract tremendous attention, which is because this interaction is responsible for finite critical current density J_c. The interaction changes with dimensionality and morphology of defects. In cuprate superconductors, vortex manifold shows vortex glass phase with point defects and Bose glass phase with columnar defects. Besides, in both cases, J_c shows pronounced enhancement compared with that in a pristine sample. We have already reported the enhancement of J_c by the introduction of point or columnar defects in the case of $Ba(Fe_{1-x}Co_x)_2As_2$ crystal. In this talk, we show the results in proton-irradiated $BaFe_2As_2$ with electron- or hole-doping. The quantitative analysis reveals the doubling of pinning potential without changing the glassy exponent in Co-doped compounds, in addition to 2.5 times enhancement of J_c. Similar effects are observed in K-doped crystals.

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