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**Coexistence of f-wave superconductivity, charge order, and spin antiferromagnetism around nonmagnetic impurities in  $\text{Na}_{0.33}\text{CoO}_2 \cdot 1.3\text{H}_2\text{O}$** <sup>1</sup> JIN AN, HAI-QING LIN, Chinese University of Hong Kong, CHANG-DE GONG, Nanjing University — To check whether charge dynamics is responsible for the superconductivity in  $\text{Na}_x\text{CoO}_2 \cdot y\text{H}_2\text{O}$ , we investigate local electronic and magnetic structure around a nonmagnetic impurities embedded in this material at  $x = 0.33$  in the vicinity of charge instability, by using a phenomenological model within the slave-boson framework including competitions among a  $\sqrt{3} \times \sqrt{3}$  charge order, antiferromagnetism and f-wave superconductivity. Around the repulsive impurities, it is found that both local charge and spin orders are induced. Furthermore, the f-wave pairing order parameter is decreased on one sublattice but increased on another honeycomb sublattice. If the charge dynamics is responsible for the superconductivity, the predicted local electronic and magnetic structure could be observed by the STM and spatial resolved NMR experiments.

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