

Abstract Submitted
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Phase Diagram for a Hidden Competing Order in the Mixed State of $\text{YBa}_2\text{Cu}_4\text{O}_8$ CRYSTALS UP TO 150 kG TAKEKAZU ISHIDA, KOJI SATO, YUZO YOSHIDA, SHUICHI KAWAMATA, Osaka Prefecture University, JST-CREST, TAKAHIKO SASAKI, NORIO KOBAYASHI, IMR, Tohoku University, SEIJI ADACHI, TAKATO MACHI, ISTECSRL, DEPT OF PHYS, OSAKA PREF UNIV, SAKAI, OSAKA 599-8531, JAPAN TEAM, JST-CREST, 4-1-8, HONCHO, KAWAGUCHI, SAITAMA 980-8577, JAPAN COLLABORATION, IMR, TOHOKU UNIV, SENDAI 980-8577, JAPAN TEAM, SRL-ISTEC, 1-10-13 SHINONOME, KOTO, TOKYO 135-0062, JAPAN TEAM — Torque measurements on $\text{YBa}_2\text{Cu}_4\text{O}_8$ crystals show multiple peaks as a function of θ_{ca} between the c axis and the magnetic field H in the c - a plane. We propose that the first peaks at $\theta_{ca} \simeq 80$ and 100 degrees arise from a possible long-range spiral spin density wave through the matching pinning between vortices and spins. We construct a contour map for a competing order parameter in $\text{YBa}_2\text{Cu}_4\text{O}_8$ which starts at a finite H and is located far from H_{c2} line. The regime of the proposed spin density wave goes to higher temperatures when field increases. The first peak does not appear when the field direction is scanned in the c - b plane. The NMR line width of the c -axis aligned $\text{YBa}_2\text{Cu}_4\text{O}_8$ powders in H perpendicular c shows broadening at temperatures below 30 K. These features might be intrinsic in the cleanest underdoped cuprate.

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