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Scanning tunneling spectroscopic evidence for a magnetic field-revealed microscopic order in the high-T_C superconductor $YBa_2Cu_3O_{7-\delta}$[1] A.D. BEYER, M.S. GRINOLDS[2], M.L. TEAGUE, N.-C. YEH, Physics Dept., Caltech, Pasadena, CA, S. TAJIMA, Physics Dept., Osaka Univ., Japan — We present spatially resolved scanning tunneling spectroscopic measurements of $YBa_2Cu_3O_{7-\delta}$ as a function of magnetic field and at $T<<T_C$. The observed *intra*-vortex quasiparticle (QP) spectra appear pseudogap (PG)-like, with an energy gap of V_{PG} ≈32meV. The value of V_{PG} is significantly larger than the observed *inter*-vortex superconducting (SC) gap, Δ_{SC}=20meV, and equal to the incommensurate spin fluctuation gap observed by neutron scattering. We also observe a secondary and less pronounced intra-vortex gap at Δ'∼7-10meV. Fourier transformation of QP spectra reveals two sets of non-dispersive, field-enhanced conductance modulations with periods of 3.4±0.5 and 7.3±0.5 lattice constants. Energy histograms of QP spectra show a significant shift from SC to primarily PG-like spectra and a growing enhancement of spectral weight at Δ' as magnetic field increases, implying a significant interplay between SC and a field-enhanced microscopic order. Ref.: Beyer, *et.al.* [arxiv:0808.3016].

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