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The crystalline electric field as a probe for long range antiferromagnetic order and superconductivity in $CeFeAsO_{1-x}F_x$[1] SONGXUE CHI, University of Tennessee, Knoxville, DEVASHIBHAI ADROJA, ISIS Facility, Rutherford Appleton Laboratory, TITIANA GUIDI, ROBERT BEWLEY, ISIS Facility, Rutherford Appleton Laboratory,, SHILIANG LI, JUN ZHAO, University of Tennessee, Knoxville, JEFFREY LYNN, CRAIG BROWN, YIMING QIU, NIST Center for Neutron Research, GEN FU CHEN, JIAN LIN LUO, NAN LIN WANG, Institute of Physics, Chinese Academy of Sciences, PENGCHENG DAI, University of Tennessee, Knoxville — We use inelastic neutron scattering to study the crystalline electric field (CEF) excitations of Ce^{3+} in $CeFeAsO_{1-x}F_x(x = 0, 0.16)$. For nonsuperconducting CeFeAsO, the Ce CEF levels have three magnetic doublets in the paramagnetic state, but these doublets split into six singlets when Fe ions order antiferromagnetically. For superconducting $CeFeAsO_{0.84}F_{0.16}$ ($T_c = 41$ K), where the static AF order is suppressed, the Ce CEF levels have three magnetic doublets at $\hbar\omega = 0, 18.7, 58.4$ meV at all temperatures. Careful measurements of the intrinsic linewidth Γ and the peak position of the 18.7 meV mode reveal clear anomaly at T_c, consistent with a strong enhancement of local magnetic susceptibility $\chi''(\hbar\omega)$ below T_c. These results suggest that CEF excitations in the rare-earth oxypnictides can be used as a probe of spin dynamics in the nearby FeAs planes.

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