

Abstract Submitted
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Crystal-field splitting in UO_2 HEINZ NAKOTTE, R. RAJARAM, New Mexico State University, S. KERN, Physics Department, Colorado State University, R. MCQUEENEY, LANSCE, Los Alamos National Laboratory, G.H. LANDER, European Commission, Joint Research Center, Institute for Transuranium Compounds — Uranium Dioxide (UO_2) is an important nuclear fuel material. We performed high-resolution inelastic neutron scattering using PHAROS at the Los Alamos spallation source LANSCE in order to re-investigate the crystal field splitting in UO_2 , determined with the knowledge of the dipole-allowed transitions. We obtained the crystal field parameters and the $5f$ electron eigen functions for UO_2 . The fourth- and sixth-degree crystal field parameters were found to be $V_4 = -116.24$ and $V_6 = 25.78$, in good agreement with previously published results by Amoretti et al. [1]. On the other hand, these previous studies did reveal four crystal-field excitations in the 150-180 meV range, only three of which can be explained by the crystal-field model. Our experiments on a different UO_2 sample show that the previously observed peak at about 180 meV is a spurious one, thus it is not intrinsic to UO_2 . [1] G. Amoretti et al., Phys. Rev. B 15 (1989) 1856

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