ZEEMAN QUANTUM-BEAT SPECTROSCOPY OF NO_2: EIGENSTATE-RESOLVED LANDÉ g_F FACTORS NEAR DISSOCIATION THRESHOLD

JU XIN, *Department of Physics and Engineering Technologies, Bloomsburg University, Bloomsburg, PA 17815*; SCOTT A. REID, *Department of Chemistry, Marquette University, Milwaukee, WI 53201*.

The sign and magnitude of Landé g_F factors for single NO_2 rovibronic (J = 3/2) eigenstates in the 15 cm^{-1} region below dissociation threshold (D_0 = 25,128.57 cm^{-1}) were investigated using Zeeman quantum-beat spectroscopy. The derived Landé g_F factors exhibit pronounced fluctuations about an average much smaller than expected in the absence of rovibronic perturbations, which destroy the goodness of the *N* and *K* quantum numbers and the *J*=*N*+*S* coupling scheme. The *F*=*J*+*I* coupling scheme was found to be valid near D_0 to within the uncertainty of our measurements, and the average Landé g_F factors near dissociation threshold are in good agreement with those calculated under the assumption of complete rovibronic mixing. Our findings do not provide evidence for the participation of repulsive quartet states near dissociation threshold.