STUDY OF THE ZEEMAN EFFECT IN THE [17.6]7.5 X18.5 TRANSITION IN HOLMIUM MONOXIDE (HoO)

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The diatomic oxides of the lanthanides and actinides have many low-lying electronic states due to the presence of open f and d orbitals on the metal. The magnetic and electric tuning of the fine structure is an effective means of identifying the dominant configuration of a particular electronic state and of testing theoretical predictions of the configurational composition of the eigenfunctions. Here we report on the first high-resolution molecular beam measurements of the Zeeman effect in electronic transitions of holmium monoxide, HoO. Several branch features in the previously detected [17.6]($\Omega = 7.5$) - X_1($\Omega = 8.5$) electronic transition were recorded at near natural linewidth limit (FWHM 35MHz) field free and in the presence of a tunable static magnetic field. The Zeeman splittings and shifts were used to extract values for the magnitudes of the magnetic g-factors respectively of the two electronic states. These are compared with theoretical predictions.