ISOTOPE EFFECT IN LASER INDUCED FLUORESCENCE SPECTRA OF DYSPROSIUM MONOCHLORIDE.

C. LINTON, *Physics Department, University of New Brunswick, Fredericton, NB, Canada E3B 5A3*; R. K. GHOSH, *Department of Physics, Princeton University, Princeeton, NJ, 08544*; M. J. DICK, *Department of Physics, University of Waterloo, Waterloo, ON, Canada N2L 3G1*; A. G. ADAM, *Department of Chemistry, University of New Brunswick, Fredericton, NB, Canada E3B 6E2*.

Two years ago, we reported the first results of an investigation into the spectroscopic properties of Dysprosium Monochloride (DyCl). In particular we discussed the results of a preliminary rotational analysis of three transitions from a common upper state which we have labeled A[16.4]8.5-X7.5, A[16.4]8.5-Y[0.15]8.5, and A[16.4]8.5-Z[0.85]7.5. One of the aims of the investigation is to use the vibration frequencies, especially that of the ground state, as a diagnostic tool to determine the electron configurations of the electronic states and to correlate the observed states with those predicted by Ligand Field theory. As only the v=0 level of the ground state has been observed, an attempt has been made to use the isotope effect to try and obtain this information. The analysis has been extended to include high resolution rotational data on various Dy (mass 164 and 162) and Cl (mass 35 and 37) isotopic species and the isotope shifts have been used to determine the vibrational frequency of the ground state. The results of the rotational analysis and isotope study will be presented and discussed in terms of the Ligand Field Theory predictions.