MEASUREMENT OF HYPERFINE STRUCTURE AND PERMANENT ELECTRIC DIPOLE MOMENTS IN THE ELECTRONIC SPECTRUM OF IRIDIUM MONOHYDRIDE AND DEUTERIDE

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High resolution spectra of $^3\Phi_4$ - $X^3\Phi_4$ transitions of IrH and IrD were obtained using the laser ablation spectrometer at Arizona State University. With linewidths lower than 50 MHz, hyperfine structure due to the nuclear spin (I = 3/2) of both iridium isotopes ^{193}Ir and ^{191}Ir was resolved. Using the optical Stark effect, which examined the tuning properties of the hyperfine lines when an external electric field was applied, permanent electric dipole moments were determined for both electronic states. The interpretation of the hyperfine parameters and dipole moments in terms of the insights they provide into the electron configurations of the two electronic states will be discussed and the results will be compared with isovalent molecules , CoH and RhH, in the same group.