HIGH RESOLUTION PROBES OF COUPLED STATES: ZEEMAN QUANTUM BEAT STUDIES OF OD($A^2\Sigma^+$,v=0,1,2,3) AND OH($A^2\Sigma^+$,v=0,1,2)

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We will report on Zeeman quantum beat studies of rovibronic levels in the $A^2\Sigma^+$ state of the hydroxyl and hydroxyl-d radicals. For each system the data extends to the onset of predissociation induced via spin-orbit coupling with a repulsive $^4\Sigma^-$ state, which occurs for OH at v=2 and for OD at v=3. Our study focused on identifying direct spectroscopic signatures of this coupling as revealed in the weak field Lande g-factors. For OD, we were also able to determine the excited state hyperfine parameters, which are a sensitive probe of the excited state electronic structure, and trends in these parameters will be discussed.