MILLIMETER-WAVE SPECTROSCOPY OF CoO (X $^4\Delta_i$) and CoF (X $^3\Phi_i$): IDENTIFYING THE HIGH SPIN COMPONENTS

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Although both CoO (X $^4\Delta_i$) and CoF (X $^3\Phi_i$) have been previously studied by rotational techniques, only transitions originating in lower spin components were recorded. To complete these investigations, rotational spectroscopy of the higher spin components of both radicals has been conducted using millimeter/sub-millimeter direct absorption methods in the range 140-530 GHz. These species were created in a d.c. discharge by the reaction of cobalt vapor and N_2O or CF_4. For CoO, the Ω = 3/2 and 1/2 spin states were measured for the first time, both of which were clearly split by lambda-doubling. Additional measurements for the Ω = 7/2 and 5/2 ladders were recorded, and the complete data set was fit with a case (a) Hamiltonian to derive spectroscopic constants. In the case of CoF, the Ω = 3 ladder was measured, and currently searches are being conducted for the Ω = 2 component. These results will also be presented.