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Raman electronic paramagnetic resonance (Raman-EPR) of Cr^{3+} in ruby[1] X. LU, Purdue University, S. VENUGOPALAN, SUNY, Binghamton, HYUNJUNG KIM, Sogang Univ. Korea, M. GRIMSDITCH, Argonne National Lab., S. RODRIGUEZ, A.K. RAMDAS, Purdue University — We have observed the Raman-EPR of the Zeeman split $^4A_2$ ground state of the Cr^{3+} ion in Al_2O_3:Cr, i.e., ruby, exploiting the resonance conditions associated with the R_1 line. Employing a tunable dye laser with a photon energy E_L in the vicinity of the Zeeman components of the R_1 luminescence, we observe the Stokes and anti-Stokes Raman transitions with shifts corresponding to the intra $^4A_2$ ground state levels split by the external magnetic field (**B**). The proximity of the incident and the scattered radiation to the Zeeman components of R_1 leads to selective dramatic resonance enhancements of the intensities of EPR transitions brought about as a function of **B** and $E_{L.}$The microscopic mechanism for the resonance enhancement involves the 'in resonance' and 'out resonance' conditions fulfilled by the virtual transitions from the sublevels of $^4A_2$ ground state to the sublevels of ^2E by the incident and the scattered radiation in a two step process. Raman-EPR of the Zeeman sublevels of ^2E excited state of R_1 is also observed.

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