

Abstract Submitted
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Hyperfine Suppression of a $2\ ^3S_1 - 3\ ^3P_1$ Radiative Transition in Helium¹ QIXUE WU, GORDON W.F. DRAKE, University of Windsor — In ^3He , we have found both experimentally and theoretically that the electric dipole radiative transition $2\ ^3S_1(F = 3/2)$ to $3\ ^3P_1(F = 3/2)$ between hyperfine states is strongly suppressed. The suppression is caused by strong hyperfine mixing and accidental cancellation between two hyperfine states with different J but the same F in the $3\ ^3P$ state. We present high precision variational calculations in Hylleraas coordinates of the line strength, including hyperfine mixing, and compare the results with experiment. The influence of a weak magnetic field up to 100 gauss on the line strength provides an additional test of this hyperfine suppression phenomenon. Theoretical calculations show that a maximum suppression occurs for the Zeeman component $2\ ^3S_1(F = 3/2, M_F = -1/2)$ to $3\ ^3P_1(F = 3/2, M_F = -1/2)$ of the hyperfine transition at approximately 65 gauss. Theoretical and experimental studies of other $n\ ^3P$ states are in progress to check for other similar suppression effects in ^3He .

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