

Abstract Submitted
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Hyperfine-induced Intercombination Transitions in $^3\text{He}^1$ QIXUE WU, GORDON W.F. DRAKE, University of Windsor — It is well known that hyperfine structure can induce transitions that are otherwise forbidden, or strongly suppressed, in heliumlike ions. We have recently found that, even in neutral helium-3, hyperfine structure can induce spin-forbidden intercombination transitions involving the higher-lying Rydberg states. In this paper we present high precision variational calculations of hyperfine-induced transitions $n\ ^1\text{D} \rightarrow n'\ ^3\text{P}$ and $n\ ^3\text{D} \rightarrow n'\ ^1\text{P}$ ($n = 3 - 10$, $n' = 2 - 9$) for ^3He . Comparable strengths of hyperfine-induced transitions to normal E1 transitions are predicted. Conversely, normally allowed transitions can be strongly suppressed by hyperfine structure, as previously discussed and observed experimentally [1], such as $n\ ^3\text{D}_1, F = 3/2 \rightarrow 2\ ^3\text{P}_2, F = 5/2$.

[1] I.A. Sulai et al. Phys. Rev. Lett. **101**, 173001 (2008).

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Gordon W.F. Drake
University of Windsor

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