

Abstract Submitted
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A Newtonian Explanation of the Hydrogen Fine Structure PAUL FISHER, West Texas A&M University, JAMES ESPINOSA¹, Rhodes College, JAMES WOODYARD, West Texas A&M University — The Hydrogen spectrum as seen by low dispersion spectrometers is correctly described by a classical theory founded on Ritz's magnetic model. With increasingly powerful instruments, individual lines are split into smaller groupings that are three orders of magnitude smaller. Arnold Sommerfeld was the first to develop a theory based on the mass variation of the electron to correctly describe this "fine" structure. A few years later, Vannevar Bush pointed out that Weber's force law could be used instead of Einstein's theory of relativity. We will utilize this line of approach to present a purely classical theory of the fine structure of the Hydrogen atom. Ritz's theory of electromagnetism replaces Weber's law; we will summarize all the other atomic physics experiments that our classical theory already describes correctly. Finally we will show how this fine structure theory logically paves the way for an explanation of the linear Stark effect.

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