

Abstract Submitted
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A Classical Description of the Hyperfine Structure of the Hydrogen Atom ANDREA CHANEY, University of Alabama, JAMES ESPINOSA¹, Rhodes College, JAMES WOODYARD, West Texas A&M University — As stronger dispersion gratings are utilized, the Hydrogen spectrum is broken into small groupings. At first, the fine structure was successfully described by Sommerfeld by utilizing the special theory of relativity. The fine structure groupings are three orders of magnitude smaller than the series separations as described by Balmer and others. With even further powerful instruments, Michelson was the first to split these lines into further groupings which are a further two orders of magnitude smaller. It was almost fifty years before Breit used quantum mechanics to describe this hyperfine structure. It is almost universally believed that classical theory utterly fails to describe this phenomenon. We will show how our classical Hydrogen atom based on Ritz's magnetic model can account for the splitting of the 1s state, which is famous for its use by radio astronomers to map out the distribution of hydrogen in the universe.

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