

Abstract Submitted
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Anomalous Zeeman Effect Experiment with Gas Discharge Spectral Tubes¹ MATTHEW FILLION, ALEXANDER HYDE, OLEG BATISHCHEV, Northeastern University — Traditionally, the Zeeman Effect is studied using Fabry-Perot etalons. However, the normal Zeeman split has been successfully detected in stellarators [1] and tokamaks [2] ($\sim 3\text{-}6\text{T}$) using large spectrometers instead. Previously, we have developed an educational permanent magnet – based system that allows the Paschen-Back limit of the Zeeman Effect to be studied by students [3]. This system was recently upgraded to deliver stronger fields and sub-pm spectral resolution using a standard spectrometer. Anomalous Zeeman splitting of the Na D-line was detected using this system, as well as many other persistent spectral lines in noble gases. [1] M. Goto and S. Morita, Phys. Rev. E 65(2), 026401 (2002). [2] J. Ghosh, et al, Phys. Plasmas 11(3), 1033–1042 (2004). [3] A. S. Taylor, A. R. Hyde, and O. V. Batishchev, American Journal of Physics, 85: 565–574, Aug. 2017.

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Oleg Batishchev
Northeastern University

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