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**A Classical Theory of the Anomalous Zeeman Effect** JAMES ESPINOSA[1], Rhodes College, JAMES WOODYARD, West Texas A&M University — Over a hundred years ago, it was discovered that spectral lines were shifted by magnetic fields. Lorentz was able to explain a small set of phenomena that was ironically called the normal Zeeman effect. It took more than twenty years for Lande to arrive at a vector model of the atom to explain the majority of shiftings called the anomalous Zeeman effect. Within a couple of years, Uhlenbeck and Goudsmit introduced the idea of a spinning electron that would give an underlying explanation of the vector model rules. It is generally taught that without the concept of spin there can be no explanation of all the spectral splittings caused by a magnetic field. We will present a purely classical model developed by Woldemar Voigt to describe the most famous anomalous splitting, the sodium D line. In addition, his theory correctly describes the transition from the weak field state to the strong one, called the Paschen-Back effect. We will show how his theory matches well with our classical picture of the atom.

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