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Large magnetoresistance and sharp switching in Fe_xTiS_2[1] JESSE CHOE, EMILIA MOROSAN, Rice University — Large magnetoresistance materials are suitable for applications in sensors, read heads, and random access memories. Most metals, though having excellent ductility which is important for manufacturing processes, have changes of magnetoresistance on the order of only $\sim 1\%$. Very large magnetoresistances in $Fe_{0.30}TaS_2$ [Phys. Rev. B 94 054406 (2016)] ($\sim 140\%$) have been attributed to misalignment of magnetic moments causing spin disorder scattering. We performed measurements of the magnetic field dependence of resistivity and magnetization of Fe_xTiS_2 single crystals ($x = 0.1 - 0.5$), which show both the large magnetoresistance, as well as the sharp switching in magnetization as those reported in the Ta analogue. By comparing and contrasting these two materials, we can gain deeper understanding of the underlying physics, allowing us to strategically search for materials with higher transition temperature, lower switching fields, and larger magnetoresistances.

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