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**Reversible Magnetostriction with Temperature in Single Crystal  $\text{Tb}_5\text{Si}_{2.2}\text{Ge}_{1.8}$**  A.P. RING, H.L. ZIEGLER, T. LOGRASSO, D. SCHLAGEL, J.E. SNYDER, Materials and Engineering Physics Program, Ames Laboratory, D.C. JILES, Wolfson Centre for Magnetism, Cardiff University, Cardiff, Wales, UK — The magnetostriction changes that accompany the phase transitions of single crystal  $\text{Tb}_5(\text{Si}_{2.2}\text{Ge}_{1.8})$  have been investigated at temperatures between 20 K and 150 K, by measurements of the reversible component of the magnetostriction along the crystallographic “a” axis. Over this temperature range the shape and slope of the magnetostriction curves change, which are indicative of changes in the magnetic state, crystal structure and magnetic anisotropy. Results show a phase transition that occurs near 106 K (onset-completion range 100 - 116 K). The abrupt nature of the strain transition, its unusual hysteresis, and its temperature dependence appear to indicate a first order phase transition which can be activated by applied magnetic field or temperature. Magnetostriction measurements at temperatures below the transition region show a magnetostriction of small overall magnitude but with a high, temperature dependent anisotropy. Funded by USDoE-Office of Basic Energy Sciences

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