Thermal Expansion, Heat Capacity and Magnetization Measurements of La$_{1.2}$Sr$_{1.8}$Mn$_2$O$_7$\footnote{This material is based upon work supported by the US DOE (DE-FG-06ER46269) and NSF (DMR-0504769).} RICHARD K. BOLLINGER, J. J. NEUMEIER, Montana State University, H. ZHENG, J. F. MITCHELL, Materials Science Division, Argonne National Laboratory — La$_{1.2}$Sr$_{1.8}$Mn$_2$O$_7$ is a bi-layered ferromagnet of perovskite structure with two dimensional magnetic and electrical properties. In this presentation, we will show measurements of the specific heat, magnetization, and thermal expansion for single crystalline La$_{1.2}$Sr$_{1.8}$Mn$_2$O$_7$ in the temperature range 300 K < $T$ < 5 K. The thermal expansion of this tetragonal crystal along the $a$ and $c$ directions will be presented, the anisotropy will be discussed, and the critical behavior near the magnetic transition will be evaluated.

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