Magnetism in \( LnMnSbO \) (\( Ln = \text{La or Ce} \))\(^1\) Qiang Zhang, Iowa State University, Naveen Kumar Chogonda Halli M., Jülich Centre for Neutron Science, Kevin Dennis, Alan Goldman, David Vaknin, Iowa State University — Neutron diffraction of polycrystalline (PND) \( LnMnSbO \) (\( Ln = \text{La or Ce} \)) reveals differences between the magnetic ground state of the two compounds due to the strong Ce-Mn coupling compared to La-Mn. The two compounds adopt the \( P_4/\text{nnm} \) space group down to 1.5 K and whereas magnetization measurements do not show any anomaly at high temperatures, PND reveals a C-type antiferromagnetic (AFM) order below \( T_N = 255 \) K for LaMnSbO and 240 K for CeMnSbO. While the magnetic structure of LaMnSbO is preserved to base temperature, a sharp transition at \( T_{SR} = 5 \) K in CeMnSbO due to a spin-reorientation (SR) transition of the Mn\(^{2+}\) from pointing along the \( c \)-axis to the \( ab \)-plane is found. The SR transition in CeMnSbO is accompanied by a simultaneous long-range AFM ordering of the Ce moments. This indicates that the Mn SR transition is driven by the Ce-Mn coupling similar to recent observation in the isostructural CeMnAsO. The ordered moments are found to be somewhat smaller than those expected for Mn\(^{2+}\) (S = 5/2) in insulators, but large enough to suggest that these compounds belong to the class of local-moment antiferromagnets. The lower \( T_N \) found in this compound compared to the As-based counterpart (\( T_N = 347 \) K for CeMnAsO) indicates that the Mn-Pn (Pn = As or Sb) hybridization that mediates the exchange Mn-Mn coupling is weaker for the Sb-based compounds.

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David Vaknin
Iowa State University