

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Local Probe Study of S=1 Spin Liquid Candidate $\text{Ba}_3\text{NiSb}_2\text{O}_9$

JEFFREY QUILLIAM, Département de physique, Université de Sherbrooke, Sherbrooke, QC, Canada, FABRICE BERT, PHILIPPE MENDELS, JEAN-CHRISTOPHE ORAIN, Laboratoire de physique des solides, Université Paris-Sud XI, Orsay, France, ANTHONI MANSEAU, Département de physique, Université de Sherbrooke, Sherbrooke, QC, Canada, CÉLINE DARIE, Institut Néel, Grenoble, France, CHRISTOPHE PAYEN, CATHERINE GUILLOT-DEUDON, Institut des Matériaux Jean Rouxel, Université de Nantes, Nantes, France — The family of hexagonal perovskites, $\text{Ba}_3M\text{Sb}_2\text{O}_9$, has attracted a considerable amount of attention in recent years, with the discovery of several spin liquid candidates. For $M = \text{Cu}$, the material is fairly disordered and likely exhibits a honeycomb-like lattice whereas in other cases the structure consists of triangular planes of spins. Three different structural phases of $\text{Ba}_3\text{NiSb}_2\text{O}_9$ have been discovered, depending on synthesis pressure [1]. Two of these phases (6HA and 6HB) consist of triangular planes of $S = 1$ moments, and differ primarily by the stacking of these planes. Here, we present muon spin rotation (μSR) and ^{121}Sb nuclear magnetic resonance (NMR) results on a high-pressure synthesis of this material, 6HB- $\text{Ba}_3\text{NiSb}_2\text{O}_9$. Most importantly, we demonstrate that there are no signs of magnetic ordering or spin freezing down to temperatures as low as 20 mK, making this material a plausible spin liquid candidate. Furthermore our NMR results are indicative of gapless excitations, consistent with previous specific heat and magnetic susceptibility results [1].

[1] J. G. Cheng *et al.*, PRL **107**, 197204 (2011).

Jeffrey Quilliam
Département de physique, Université de Sherbrooke

Date submitted: 14 Nov 2014

Electronic form version 1.4