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Local Probe Studies of the Quantum Honeycomb Antiferromagnet $Ba_3CuSb_2O_9$[1] JEFFREY QUILLIAM, Laboratoire de Physique des Solides, Université Paris-Sud; Université de Sherbrooke, FABRICE BERT, EDWIN KERMARREC, Laboratoire de Physique des Solides, Université Paris-Sud, CHRISTOPHE PAYEN, CATHÉRINE GUILLOT-DEUDON, Institut des Matériaux Jean Rouxel, Université de Nantes, PIERRE BONVILLE, Service de Physique de l'État Condensé, CEA-CNRS, CE-Saclay, PHILIPPE MENDELS, Laboratoire de Physique des Solides, Université Paris-Sud — The 6H-perovskites, $Ba_3MSb_2O_9$, have generated an enormous amount of interest in the last two years following the possible discovery of quantum spin liquid physics in two such materials. We present local probe studies (muon spin rotation and nuclear magnetic resonance) on the spin-1/2 honeycomb antiferromagnet $Ba_3CuSb_2O_9$. We show that the system presents no spin freezing down to temperatures as low as 20 mK. NMR measurements show evidence of a spin gap and suggest that the material has a random singlet ground state rather than the alternative spin-orbital liquid state.

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