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**$\mu$SR study of spin dynamics and phase transition of the two-dimensional tetramer-cuprate $Na_5RbCu_{4(}AsO_4)_4Cl_2$** ANNIKA KRIISA, RAIVO STERN, National Institute of Chemical Physics and Biophysics, SHIOU-JYH HWU, WENDY QUEEN, Department of Chemistry, Clemson University, HUBERTUS LUETKENS, Laboratory for Muon-Spin Spectroscopy Paul Scherrer Institut — In an effort to explain the magnetic properties of such low-dimensional systems, $^{87}$Rb Nuclear Magnetic Resonance (NMR) experiments in a $Na_5RbCu_4(AsO_4)Cl_2$ system were performed. This novel two-dimensional (2D) cuprate contains layers of coupled $Cu_4O_4$ tetramers. The spin exchange interactions are confined to 2D layers and the Cu are divalent, making the system a s=1/2 antiferromagnet. In zero applied magnetic field, it orders antiferromagnetically via a second-order phase transition at $T_N$=15(1) K. The ordered state was characterized by $^{87}$Rb NMR, and a non-collinear rather than collinear arrangement of spins was suggested. New structural phase transition(s) around 74 and 110 K were also evidenced. We present a $\mu$SR study of this cuprate. The investigation of the spin dynamics (via the muon longitudinal relaxation rate $\lambda$(T) ) in the temperature range 2<T<300K in zero-field, with particular attention to the order parameter below $T_N$ and around structural phase transitions at T$\sim$74K and T$\sim$110K is shown.

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