Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

μSR studies of the extended kagome systems $YBaCo_4O_{7+\delta}$ (δ = 0 and 0.1) SUHEON LEE, WONJUN LEE, Chung-Ang University, JOHN MITCHELL, Argonne National Laboratory, KWANG-YONG CHOI, Chung-Ang University — We present a μSR study of the extended kagome systems $YBaCo_4O_{7+\delta}$ (δ = 0 and 0.1), which are made up of an alternating stacking of triangular and kagome layers. The parent material $YBaCo_4O_{7.0}$ undergoes a structural phase transition at 310 K, releasing geometrical frustration and thereby stabilizing an antiferromagnetically ordered state below T_N = 106 K. The μSR spectra of $YBaCo_4O_{7.0}$ exhibit the loss of initial asymmetry and the development of a fast relaxation component below T_N = 111 K. This indicates that the Co spins in the kagome planes remain in an inhomogeneous and dynamically fluctuating state down to 4 K, while the triangular spins order antiferromagnetically below T_N. The nonstoichiometric $YBaCo_4O_{7.1}$ compound with no magnetic ordering exhibits a disparate spin dynamics between the fast cooling (10 K/min) and slow cooling (1 K/min) procedures. While the fast-cooled μSR spectra show a simple exponential decay, the slow-cooled spectra are described with a sum of a simple exponential function and a stretched exponential function. These are in agreements with the occurrence of the phase separation between interstitial oxygen-rich and poor regions in the slow-cooling measurements.

Suheon Lee
Chung-Ang University

Date submitted: 11 Nov 2016 Electronic form version 1.4