Ferromagnetic quantum criticality in Sm$_{1-x}$La$_x$NiC$_2$ ($x=0.85$, 0.92 and 0.96) WONJUN LEE, SUHEON LEE, Chung-Ang University, TUSON PARK, Sungkyunkwan University, K.-Y. CHOI, Chung-Ang University — We report SR experiments on the ternary compounds Sm$_{1-x}$La$_x$NiC$_2$ ($x=0.85$, 0.92, and 0.96), possessing a non-centrosymmetric orthorhombic CeNiC$_2$ structure (Amm2). The end members of these compounds have the ferromagnetic (FM) and charge-density-wave states at $x=0$ and the superconducting (SC) state at $x=1$. A FM quantum criticality (QC) is anticipated to occur around $x=0.92$. The $x=0.96$ SC sample exhibits a linear $T$ dependence of the muon relaxation rate $\lambda_{\text{muon}}$, giving no indication of time-reversal symmetry breaking unlike the $x=1$ sample. ZF-SR measurements of the $x=0.85$ FM sample show a steep increase of $\lambda_{\text{muon}}$ below 5 K without obvious muon-spin precession, suggesting the formation of an inhomogeneous, weak magnetic ordered state. Longitudinal field-SR experiments unveil an ordered volume fraction of about 56 %. For a case of the putative $x=0.92$ QC compound, the static fraction is decreased to 15 %, while $\lambda_{\text{muon}}$ extracted from the ZF-SR spectra display “persisting spin dynamics”. This suggests that the $x=0.92$ sample is close to QCP.