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Direct evidence for a pressure induced nodal superconducting gap in the $Ba_{0.65}Rb_{0.35}Fe_2As_2$ superconductor ZURAB GUGUCHIA, Laboratory for Muon Spin Spectroscopy, Paul Scherrer Institute, Switzerland, ALEX AMATO, PSI, JIAN KANG, University of Minnesota, USA, HUBERTUS LUETKENS, PABITRA K. BISWAS, PSI, GIACOMO PRANDO, IFW Dresden, Germany, FABIAN V. ROHR, Universitat Zurich, Switzerland, ZBIGNIEW BUKOWSKI, Institute of Low Temperature and Structure Research, Poland, ALEXANDER SHENGELAYA, Tbilisi State University, Georgia, HUGO KELLER, Universitat Zurich, Switzerland, ELVEZIO MORENZONI, PSI, RAFAEL M. FERNANDES, University of Minnesota, USA, RUSTEM KHASANOV, PSI — In contrast to other unconventional superconductors, in the Fe-based superconductors (Fe-HTSs) both d-wave and extended s-wave pairing symmetries are close in energy. Probing the proximity between these different superconducting (SC) states and identifying experimental parameters that can tune them is of central interest. We report high-pressure muon spin rotation experiments on the temperature-dependent magnetic penetration depth in the optimally doped nodeless s-wave Fe-HTS $Ba_{0.65}Rb_{0.35}Fe_2As_2$. Upon pressure, a strong decrease of the penetration depth is observed, while the SC transition temperature remains nearly constant. More importantly, the low-temperature behavior of the inverse squared magnetic penetration depth, which is a direct measure of the superfluid density, changes qualitatively from an exponential saturation at zero pressure to a linear-in-T behavior at higher pressures, indicating that hydrostatic pressure promotes the appearance of nodes in the SC gap.

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