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Superconductivity of $PrPt_4Ge_{12}$ and $LaPt_4Ge_{12}$ filled skutterudite compounds WALTER SCHNELLE, MICHAEL NICKLAS, HELGE ROSNER, ANDREAS LEITHE-JASPER, ROMAN GUMENIUK, YURI GRIN, PETER THALMEIER, MPI for Chemical Physics of Solids, Dresden, Germany, ALEXANDER MAISURADZE, RUSTEM KHASANOV, ALEX AMATO, Laboratory for Muon Spin Spectroscopy, Paul Scherrer Institute, Villigen, Switzerland — Among the recently discovered rare-earth filled skutterudites $R\mathrm{Pt_4Ge_{12}}$ (R = La–Nd, Sm, Eu) there are two superconducting compounds - $\mathrm{LaPt_4Ge_{12}}$ and $\mathrm{PrPt_4Ge_{12}}$ [1]. In the latter Pr is in a well-separated singlet crystal field ground state. This allows for a rather high T_c of 7.9 K - comparable to the T_c = 8.3 K of $\mathrm{LaPt_4Ge_{12}}$. By muon spin rotation and specific heat measurements a superconducting gap with point nodes and time-reversal symmetry (TRS) breaking is found below T_c for $\mathrm{PrPt_4Ge_{12}}$ while the La compound does not show TRS breaking [2,3]. Interestingly, samples of $\mathrm{Pr_xLa_{1-x}Pt_4Ge_{12}}$ have very similar T_c. We discuss the implications of these observations for the superconducting order parameters of these compounds.
[1] R.Gumeniuk et al., Phys.Rev.Lett. 100, 017002 [2] A.Maisuradze et al., Phys.Rev.Lett. 103, 147002 [3] A.Maisuradze et al., submitted

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