Electronic structure of *f*-electron intermetallic compounds studied by positrons

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The isostructural rare-earth compounds $TmGa_3$, $ErGa_3$, and $CeIn_3$ are interesting for their magnetic properties and, $CeIn_3$, for the intriguing interplay of antiferromagnetism, heavy-fermion behaviour and superconductivity under application of pressure [1]. Their electronic structure has recently been studied by measurements of two-dimensional angular correlations of positron annihilation radiation (2D ACAR), yielding line projections of the electron-positron momentum density $\rho(\mathbf{p})$ [2]. For all the systems the *f*-electrons are mostly localized in the paramagnetic phase, while their Fermi surfaces (FS) are slightly different. $TmGa_3$ and $ErGa_3$ exhibit the FS nesting feature, in agreement with the observed magnetic structure, which is not seen in $CeIn_3$ having a different magnetic structure. Because the FS geometry has critical importance to draw these conclusions, we present how various tomographic techniques can affect the 3D momentum densities and FS of the systems [3].

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