Kaczorowski *et al.* Reply: In the preceding Comment [1], Uhlířová, Prokleška, and Sechovský state that the single crystals of Ce_2PdIn_8 investigated in Ref. [2] were contaminated by some amount of $CeIn_3$, which resulted in misinterpretation of the observed antiferromagnetic (AF) ordering below 10 K. They demonstrate the result of their energy dispersive x-ray (EDX) analysis that clearly indicates a sandwichlike character of single crystals grown by technique similar to that applied in Ref. [2], with well-defined regions of Ce_2PdIn_8 and $CeIn_3$. Indeed, our recent metallurgical investigations of the system do corroborate the findings by Uhlířová, Prokleška, and Sechovský and point out that the presence of $CeIn_3$ in such crystals is hardly avoidable. Because of overlapping of the Bragg peaks due to $CeIn_3$ with those of Ce_2PdIn_8 and possible residues of indium flux, it is not possible to detect small amounts (about 10%) of the binary phase in x-ray diffraction experiments. Moreover, EDX study on single-crystalline surfaces is not capable of revealing the presence of a layer of $CeIn_3$ located beneath a relatively thick layer of Ce_2PdIn_8. These unfortunate shortcomings of the standard sample characterization methods, as well as quite good reproducibility of the results of electrical resistivity and heat capacity measurements performed on a few crystals taken from different batches, have led us to the incorrect conclusion on the intrinsic character of the antiferromagnetic order in the compound studied. In Fig. 1 we present the low-temperature characteristics of one of those crystals, in which the $CeIn_3$ layer has been removed by polishing the sample down to the thickness of about 100 μm. Clearly, no phase transition other than that due to superconductivity (SC) is observed, thus definitively ruling out the concept of SC emerging out of AF state.

The authors of the Comment agree with our statement in Ref. [2] that heavy-fermion (HF) superconductivity is a bulk property of Ce_2PdIn_8, yet they do not present any physical data to illustrate the superconducting behavior in their samples. Furthermore, Uhlířová, Prokleška, and Sechovský pronounce a large spread in the values of the critical temperature measured for their crystals ($T_c =$ 0.45–0.7 K), which is at odds with our own findings. Actually, all the single crystals we studied thus far have been found to superconduct below $T_c = 0.70 \pm 0.02$ K (as examples, see the data in Fig. 1 and in Ref. [2]). Most recently, the very same T_c has been observed for high-quality polycrystalline samples of Ce_2PdIn_8 [3]. In all cases, the SC transition has been well defined in both the electrical resistivity and the heat capacity data, while the parameters describing the superconducting state have had values very similar to those reported in Ref. [2], which undoubtedly manifest its HF character. Most importantly, in an extended range above T_c the behavior of Ce_2PdIn_8 distinctly differs from the predictions for a Fermi liquid, namely, the resistivity is a linear function of the temperature and the specific heat over temperature ratio diverges with decreasing the temperature (see Fig. 1 and Ref. [3]). These features suggest the presence of antiferromagnetic spin fluctuations and hint at an unconventional character of the superconducting state that possibly emerges in the proximity of a quantum critical point instability, alike in the related HF superconductors $CeTIn_5$ and Ce_2TIn_8 with $T =$ Co, Rh, and Ir [4]. The latter hypothesis seems supported by recently obtained muon spin rotation spectroscopy and inelastic neutron scattering data [5], which clearly evidence magnetically driven superconducting behavior in Ce_2PdIn_8, even if long-range AF order is actually absent as an intrinsic property of this compound.

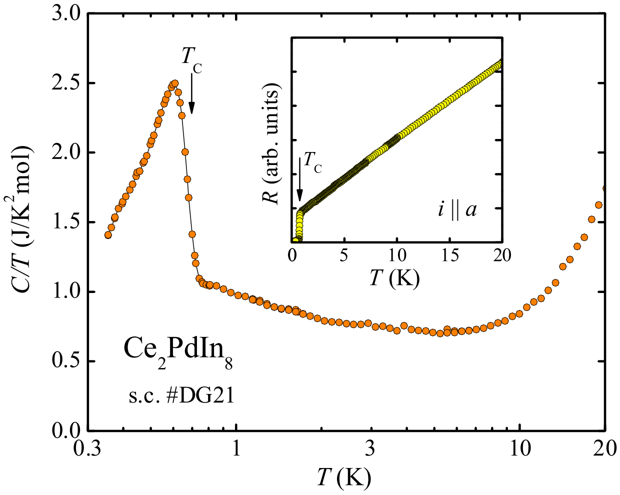

FIG. 1 (color online). Low-temperature dependencies of the specific heat over temperature ratio, and the electrical resistance along the a axis (inset) of single-crystalline Ce_2PdIn_8.

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