We found that the field of the MR saturation $B_{\text{sat}}$ is strongly sample-dependent, being different by a factor of up to two for different samples at a given density of mobile electrons. In subsequent studies [2], a similar observation was reported for a single sample cooled down at different gate voltage values. Based on these results, we highlighted in Ref. [3] the role of sample-specific localized states (disorder) in the strong-eld MR, and concluded that the eld at which the MR saturates does not re ect spin-polarization of mobile carriers solely.

In the Comment to our paper [1], Dolgopolov and Gold (DG) attempt to explain the experientially observed non-universality (i.e., the sample dependence) of the $B_{\text{sat}}$ eld. For the two-dimensional (2D) case, they apply a two-uid model, which is known for the 3D Anderson-Mott transition, with the aim to calculate a disorder-dependent eld of complete spin polarization. DG do not calculate the MR, but implicitly identify $B_{\text{sat}}$ with $B_{\text{sat}}^D$, thus using the assumption which was questioned in Ref. [1].

The density of electrons $n$, which is plotted on the horizontal axes of Fig. 2 of Ref. [1], is deduced from the period of Shubnikov-de Haas oscillations, as stated in our paper. The oscillations in the 2D case have a frequency equal to $n_{SDH} = n_h$, where $n_h$ is the density of ud quanta, and $n_{SDH}$ is the density of those electrons which participate in cyclotron motion and occupy the Landau levels.

In order to explain our observation of the disorder-dependent $B_{\text{sat}}$, DG suggest to deduce the density of extended states $n_{\text{ext}}$ by subtracting the density of singly occupied localized states $n_{\text{loc}}$ from the density $n = n_{\text{SDH}}$. The relation $n_{\text{ext}} = n_{\text{SDH}} - n_{\text{loc}}$ was automatically ful lled if all electrons (localized and extended) would participate in the SdH effect. However, it can be questioned whether this is the case, and the DG model does not answer this question. The "reduced" quantity $n_{\text{ext}}$ is further used in order to obtain a reduced e $B_{\text{sat}}^D$ of the complete spin polarization of extended states. To calculate the reduced $B_{\text{sat}}$ value, DG take into account a constant density of states $\rho$. But in their model, $\rho$ has to be reduced for lower lying states and the shift in $B_{\text{sat}}$ might have opposite sign! De ningly, the behavior of localized states in magnetic eld in the Hubbard model with strong on-site interaction requires a more thorough consideration.

We note that in order to explain the observed changes in $B_{\text{sat}}$ of up to 2 Tesla (see e.g., Fig. 2 of Ref. [1] and Fig. 4a of Ref. [3]) in the DG model, the density of extended states must be reduced by $10^{11}$ cm$^{-2}$. In a typical situation where the total density of electrons in the sample (calculated from the capacitance) is $10^{11}$ cm$^{-2}$ (see e.g., Fig. 1 of Ref. [3]) and equals to within 5% to the measured $n_{SDH}$, such reduction would lead to practically zero density of mobile electrons, enormously reduced density of states and electronic mass all these effects are not observed and seem very unlikely.

Another point concerns the second paragraph of the Comment. The authors misguide the readers in prescribing a statement to our paper about an interrelation between the Hall voltage and the SdH period, which is not used there. Moreover, just opposite results have been observed and reported by us in Ref. [3]. Thus, DG use arguments which do not belong to our paper and which contradict our view. A key misleading is that DG ignore the data for two samples (rather than one) in Fig. 2 of Ref. [1], which disagrees with their model, and ignore the non-linear dependence of the set density $n_s$ versus inverse sample mobility (which can be noticed from the data reported in Ref. [3]). The latter suggests that an "ideal sample" (with high mobility) would show $B_{\text{sat}}$ substantially larger than the calculated spin polarization in $B_{\text{sat}}^D$.

Further, the approach of DG is incomplete. The main equation of proportionality between $B_{\text{sat}}$ and the density $\rho$ means that DG assume a constant 2D density of states to be valid for the strongly interacting 2D liquid at $\rho$. There is neither theoretical nor experimental cause to believe that the relation between the $B_{\text{sat}}$ and $E_F$ can be so simple. The problem of the spin-polarization in elds $E_F$ is a large energy problem, beyond the framwork of the Fermi-liquid concept.

To conclude, we agree with the authors of the Comment in the sense that the localized electrons and mobile moments associated with localized states in 2D systems play an important role in transport at low densities. The experimental evidence for this is one of the main results of our paper [1]. However, we disagree with the oversimplified proposed model as it is inconsistent with the experimental results.

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[1] V. M. Pudalov, G. Brunthaler, A. Prinz, and G. Bauer, Phys. Rev. Lett. 88 176401 (2002).
[2] V. M. Pudalov, M. E. Ge百分之henson, H. Koijn, Cond-mat/0201001.
[3] V. T. Dolgopolov, A. V. Gol'd, cond-mat/0203274.

[4] V. M. Pudalov, G. Brunthaler, A. Prinz, and G. Bauer,

JETP Lett. 70, 48 (1999).