Stupp *et al.* Reply: We recently proposed [1] to restrict the critical region of the disorder-induced metal-insulator transition (MIT) in heavily doped semiconductors on the metallic side to the range where the electrical conductivity $\sigma(T)$ decreases for $T \to 0$. This conjecture which has not been questioned by Rosenbaum, Thomas, and Paalanen [2] restricts for uncompensated Si:P the critical range of P concentrations N to $N/N_c < 1.1$ where N_c is the critical concentration. In this range we found an asymptotic critical conductivity exponent $\mu = 1.3$. This restriction puts more weight on careful measurements for samples close to N_c and raises concerns about sample homogeneities as already discussed in our original Letter [1].

Rosenbaum, Thomas, and Paalanen [2] show conductivity data taken at $T = 3$ mK for two samples tuned by uniaxial stress S, which differ strongly for $\sigma < 5$ $\Omega^{-1}\text{cm}^{-1}$. One also sees a systematic difference between the two data sets at higher S. We note that the data (diamonds) as well as previous σ data for 3 mK [3] and earlier data for $\sigma(0)$ [3], all between 5 and 15 $\Omega^{-1}\text{cm}^{-1}$, actually can be better presented by $\sigma \sim (S - S_c)^\mu$ with $\mu \approx 1$ than with $\mu \approx 0.5$.

In order to amplify our viewpoint that our data close to N_c [1] contain the essential physics of the MIT we investigated if the conductivity $\sigma(N,T)$ obeys scaling. It should scale in a three-dimensional (3D) system as [4]

$$\frac{\sigma(N,T)}{[(N-N_c)/N_c]^\nu} = \mathcal{F}\left(\frac{T}{[(N-N_c)/N_c]^{z\nu}}\right), \qquad (1)$$

with the localization-length exponent ν and the dynamical exponent z. Wegner scaling predicts $\mu = \nu$ in 3D. Figure 1 shows a plot corresponding to Eq. (1) of the data [1] for $N \lesssim 1.1 N_c$ and temperatures up to 0.4 K (we have eliminated some data points at lowest T where heating effects are obvious [1]). Nice scaling is observed with $\nu = 1.3$ [in agreement with the scaling of $\sigma(0)$ in the critical region [1]] and $z = 2.4$. The z value falls in the range generally expected [4]. On the other hand, scaling according to Eq. (1) is apparently not very well obeyed [4] for the stress-tuning (ST) data [3]. Our observation of scaling close to N_c (over 5 orders of magnitude in the argument of $\mathcal{F}$) clearly shows that our data can, in fact, very well be compared with theories of critical phenomena. Of course, as in any real transition, sample inhomogeneities might play a role and may be the cause of the remaining scatter in our scaling plot.

Concerning the consistency of determining N_c on both sides of the transition we observe Mott variable-range hopping $\sigma(T) = \sigma_0 \exp[(-T_0/T)^{1/4}]$ on the insulating side close to N_c. With $T_0 \sim \xi^{-3}$ we obtain $\xi \sim (N_c - N)^\nu$ with $\nu \approx 1$, $N_c = 3.53 \times 10^{18}$ cm^{-3} for $(N_c - N)/N_c < 0.1$ [5], consistent with $\nu = \mu$ and in very good agreement with $N_c = 3.52 \times 10^{18}$ cm^{-3} determined on the metallic side [1]. Also, thermoelectric power data for Si:P [6] are consistent with this value of N_c. On the other hand, the

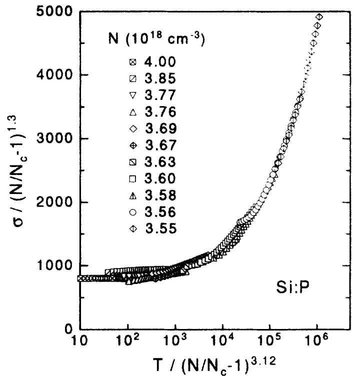

FIG. 1. Scaling plot of the electrical conductivity $\sigma(N,T)$ according to Eq. (1). Data after Ref. [1], with $N_c = 3.52 \times 10^{18}$ cm^{-3}.

ST data of the dielectric constant on the insulating side were taken for a sample with a critical stress $S_c \approx 3.1$ kbar as inferred from Fig. 3 of Ref. [7], while the metallic side was investigated by ST samples with S_c between 6.3 and 6.5 kbar [3]. Hence, S_c appears not to have been determined self-consistently, contrary to what is suggested by Fig. 1 of Ref. [7] and in Ref. [2].

In conclusion, we observe scaling of the conductivity $\sigma(N,T)$ of uncompensated Si:P close to the MIT confirming the exponent $\mu = 1.3$ and have determined N_c consistently for our samples on both metallic and insulating sides of the transition. We thus maintain that we offer a valid solution to the conductivity exponent puzzle. Possibly the stress-tuning mechanism has to be investigated in more detail to resolve the remaining discrepancies, i.e., lack of scaling in these experiments.

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