Bobroff *et al.* Reply: In their Comment, Morr et al. [1] have cross-checked our numerical work in order to interpret our ^{17}O NMR data on impurity effects in underdoped cuprates. We assumed a Gaussian shape for $\chi''(\mathbf{q})$, as suggested by neutron experiments [2]. For such a shape, Morr *et al.* reproduce our result: The NMR broadening is not sensitive to any realistic variation of correlation length ξ. The inset of their Fig. 1 is indeed in complete agreement with [3] (Fig. 3). However, for a Lorentzian shape for $\chi'(\mathbf{q})$, they find that the NMR broadening increases with ξ, in contrast with the Gaussian case. Although we initially performed a similar calculation, we were misled by a computer bug, which resulted in similar results as for the Gaussian case. We, therefore, did not study this case in detail. Our new computations yield results in complete agreement with those of Morr *et al.* The different ξ dependences of the NMR broadening for the Gaussian and the Lorentzian susceptibility can be understood from the argument we displayed in [3] (Fig. 4): in the particular case of the ^{17}O NMR, the broadening is sensitive to the derivative of $\chi'(\mathbf{r})$. The envelope of this derivative has maxima in the Gaussian case, whereas it is monotonous in the Lorentzian case, leading to a qualitative difference for the NMR broadening.

Following a recent observation [4], we also took into account a possible incommensurability in the shape of $\chi'(\mathbf{q})$, even though there is still no experimental consensus [5]. Assuming peaks for $\chi'(\mathbf{q})$ at $((1 \pm 0.1)\pi/a, (1 \pm 0.1)\pi/a)$ in $\mathbf{q}$ space, we find a change of less than 15% in the ^{17}O NMR broadening as compared to the commensurate case (in both Lorentzian and Gaussian cases). Thus, such an incommensurability does not affect our analysis.

The next step of our discussion consisted in trying to extract the T dependence of ξ, from the experimental product $T_{2G}T\Delta\nu_{\mathrm{imp}}$ [6], which depends only on ξ, and varies as $f(\xi)/\xi$. Here, $f(\xi)$ is given by simulation results for the ^{17}O NMR broadening. In the Gaussian case, f is independent of ξ, which implies that $T_{2G}T\Delta\nu_{\mathrm{imp}}$ behaves as $1/\xi$. We used actual data for $^{17}T_{2G}$ to perform Keren's corrections to the raw data for $^{63}T_{2G}$ (Ref. [9] in [3]). We do find in that case that the situation still seems "awkward" [3], because it implies that ξ increases with T.

In the Lorentzian case, the function $f(\xi)$ is nearly linear with ξ and goes to zero for $\xi \rightarrow 0$ [7]. The ratio $f(\xi)/\xi$ increases with increasing ξ, but depends only slightly on ξ for $\xi/a < 4$, as represented in Fig. 1 for our own simulations. If $\xi/a < 4$, one may conclude that $\xi(T)$ decreases with increasing T, as proposed in the spin fluctuation scenario [8]. If $\xi/a > 4$, it is hazardous to attempt to extract its exact T dependence (or even its sense of variation) from that of $T_{2G}T\Delta\nu_{\mathrm{imp}}$.

The cross-check done by Morr *et al.* is very important as it reveals that our experiment using ^{17}O NMR and impurity effects is very sensitive to the shape of $\chi'(\mathbf{q})$, which might be more complicated than Lorentzian or Gaussian

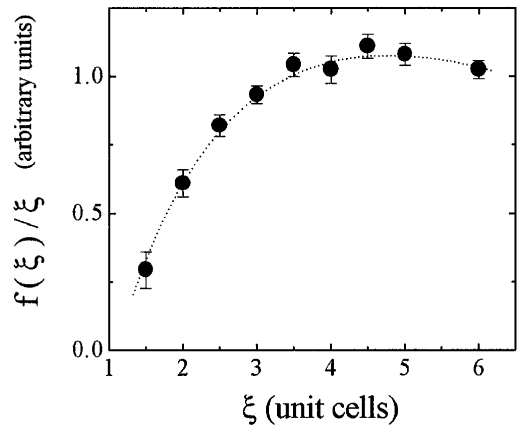

FIG. 1. The ratio $f(\xi)/\xi$ is shown as a function of the correlation length ξ, from numerical simulations using $x = 2\%$ and a Lorentzian shape of $\chi'(\mathbf{q})$. It represents the ξ dependence expected for $T_{2G}T\Delta\nu_{\mathrm{imp}}$. The dashed curve is a guide to the eye.

[9]. It is clear now that the T-dependence of ξ, which can be deduced from the data, also strongly depends on the shape of χ' used in the simulations. While the present analyses are based mainly on the T-dependences of the NMR widths, we are led to consider the detailed NMR spectra shape to try to determine the actual q dependence of χ'. Such an experimental development would be important for more refined analyses of the magnetic properties of the high-T_c cuprates.

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[7] In the calculation of Morr *et al.* [1] the function g plotted in their Fig. 1 has been computed as the convolution of their simulated spectra with a Gaussian with width unity. Then, $f(\xi)$ is approximately $g(\xi) - 1$.
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