Brambilla *et al.* Reply: Reinhardt *et al.* [1] (RWF) use mode-coupling theory (MCT) to analyze a subset of our data [2] and question our claim that dense colloidal hard spheres enter at large volume fraction φ, a dynamical regime not described by MCT. To reach this conclusion, RWF fit intermediate scattering functions (ISFs) obtained by light scattering to the outcome of MCT calculations for a monodisperse system of hard spheres. By freely adjusting the short-time diffusion coefficient D_s, and w, the parameter fixing the relative contribution of self and collective dynamics to the signal, they reproduce well the short-time decay of the data to a plateau. More crucially, to reproduce also the long-time decay, RWF need to adjust, for each experimental volume fraction φ considered, the volume fraction $\varphi^{\rm mct}$ of the corresponding theoretical curve. Since the shape of the ISF does not change much with φ, this analysis is nearly equivalent to adjusting the typical relaxation time $\tau_\alpha(\varphi)$, which we had done more simply by fitting the data to a stretched exponential form [2].

RWF's MCT analysis differs from ours when they then estimate the location, φ_c, of what we claim is an avoided MCT transition. If MCT predictions were an appropriate representation of our data, the fitted $\varphi^{\rm mct}(\varphi)$ should be a linear function of φ, with the critical density φ_c estimated from $\varphi^{\rm mct}(\varphi_c) = \varphi_c^{\rm mct}$, with $\varphi_c^{\rm mct} = 0.5159$. RWF obtain $\varphi_c = 0.595$, although deviations from linearity are evident in their Fig. 1b. Indeed, we find that the value of φ_c determined according to this procedure decreases systematically from 0.595 to 0.590 when the upper limit of the fitting interval varies from $\varphi = 0.5908$ to $\varphi = 0.5852$, indicating that the relation $\varphi^{\rm mct}(\varphi)$ is not linear. In the absence of an unambiguous criterium for selecting the "best" φ_c from RWF analysis, it is mandatory to compare the experimental $\tau_\alpha(\varphi)$ to the MCT prediction, $\tau_\alpha \sim (\varphi_c - \varphi)^{-\gamma}$. In Fig. 1(a) we show that with the values $\varphi_c = 0.595$ and $\gamma = 2.46$ obtained by RWF, the fit deviates from the data in a systematic manner for all φ. Thus, RWF's MCT analysis reproduces experimental ISFs but fails to accurately determine φ_c.

In Fig. 1(b), we show a log-log plot of τ_α vs $(\varphi_c - \varphi)^{-1}$, where the MCT critical law becomes a straight line of slope γ, thus allowing for a more stringent test of an MCT description. We find again that an absolute determination of φ_c is ambiguous as γ and φ_c are correlated fitting parameters evolving from ($\gamma = 2$, $\varphi_c = 0.585$) to ($\gamma = 6.4$, $\varphi_c = 0.605$). In particular, we determine $\gamma = 3.4 \pm 0.1$ for the RWF preferred value $\varphi_c = 0.595$, while they advocate $\gamma = 2.46$. In our work [2] we had used Fig. 1(b) to determine the best pair (φ_c, γ) that fits our data. We imposed $\gamma = 2.6$, as obtained from MCT theoretical calculations (the precise value depends of the specific approximation used in the theory) and deduced $\varphi_c = 0.59$. As shown in Fig. 1(a) this choice opens a genuine "MCT regime," which is absent in RWF's analysis. We are then left with ISFs fully decaying to zero for *seven* samples above φ_c, with significant deviations of τ_α with respect to the divergence predicted by MCT [2,3]. This motivated us to interpret these significant deviations from MCT predictions as the observation of a different, activated dynamical behavior entered by colloidal hard spheres above the divergence predicted by MCT.

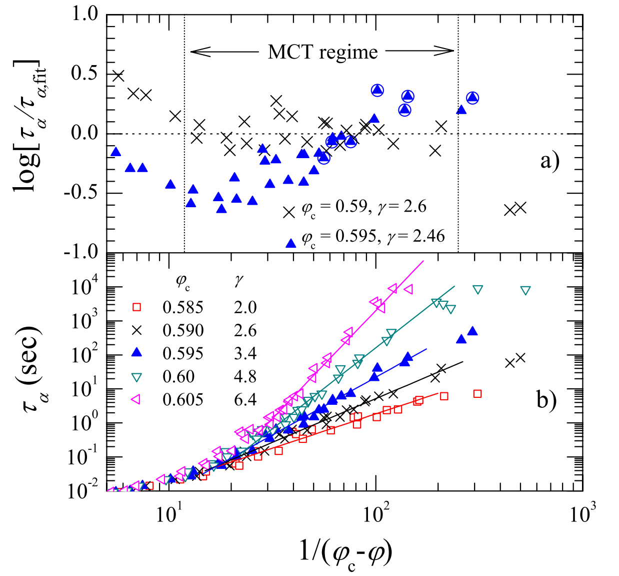

FIG. 1 (color online). (a) Comparison of the experimental decay time of the ISF, τ_α, to that predicted by a MCT fit, $\tau_{\alpha,\rm fit}$. Systematic deviations are observed using RWF values, both when considering the full set of data (solid triangles) or the subset analyzed in Ref. [1] (circles), while a genuine MCT regime exists in our analysis (crosses). (b) τ_α vs $(\varphi_c - \varphi)^{-1}$, for various choices of φ_c with critical law fits to the data (lines), with an exponent γ shown in labels. Crosses correspond to $\varphi_c = 0.59$, $\gamma = 2.6$ as in Ref. [2], while solid triangles correspond to $\varphi_c = 0.595$, but with $\gamma = 3.4$, inconsistently with Ref. [1].

G. Brambilla, D. El Masri, M. Pierno,
L. Berthier, and L. Cipelletti
LCVN UMR 5587
Université Montpellier 2 and CNRS
34095 Montpellier, France

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