Mendoza-Coto, Stariolo, and Nicolao Reply: Rizzi and Alves (RA) [1] argue that our results in [2] are not sufficiently general to determine the nature of the isotropic-nematic transition. Their main argument is a result from simulations of the *dipolar Ising model* (DI) for a case where lattice induced anisotropies are strong, showing a weak first order phase transition instead of the Kosterlitz-Thouless (KT) transition predicted for a coarse grained dipolar model in our work. This corresponds to $\boldsymbol{\alpha} \geq 2$, where we recover well-known results of Toner and Nelson [3]. Since both, this well established theory for stripe melting in two dimensions and our results, apply to strictly *isotropic* systems, criticisms of RA are outside the scope of our work.

In fact, while the model studied by us is defined on the continuum and has a continuous O(2) rotational symmetry (see Fig. 1), the DI model simulated by RA is defined on a square lattice. Moreover, the DI is a discrete model and for their choice of parameter $\delta = 2$, the equilibrium stripe width is *two* lattice spacings [4]. Under these conditions every spin comprises, on average, a sharp (Ising) domain wall between stripes, and lattice effects are particularly strong. This is clearly reflected in Fig. 1 of their comment, where it can be seen that even in the disordered phase, the modulations follow the principal directions of the lattice, displaying a discrete Z(4) symmetry ("tetragonal liquid state"). Because of this, there is no reason to expect that the nature of the orientational transition in both models should be the same. It is worth mentioning that experimental realizations of the models considered here, namely ultrathin ferromagnetic films with perpendicular anisotropy on planar substrates, do not show any obvious lattice anisotropy effects (see, e.g., [5,6]).

Apart from the aforementioned lattice induced phenomena in the low-δ regime, the DI model should also be distinguished from the continuous model in the low temperature regime. Because of the discrete nature of the DI, there is always a finite energy gap between the stripe ground state and any elementary excitation, absent in the continuous model. This implies the existence of a phase with long range positional order (stripe phase) [4,7]. Evidence of this "crystal-like" phase can be seen on the left side of the caloric curve shown by RA. On the other side, this phase is absent in the continuous model, which at most admits a quasi-long-range positionally ordered phase at low temperatures, when anisotropies are taken into account [8]. Thus, the physics of the continuous model and that of the DI model cannot be considered equivalent at low temperatures.

RA also criticize our simulation results, arguing that the finite size analysis in [2] is inconclusive because of the small system sizes simulated. Their results are limited to a single system of 72^2 sites. We have reached systems of 726^2 sites, showing a behavior consistent with our theoretical results over a considerable window of system sizes (132 to 726 linear sizes), enough to discriminate the different universality classes, for $\alpha < 2$ and $\alpha \geq 2$. Langevin simulations of the corresponding scalar field theories are more suited for probing the continuous rotational symmetry [9], as is evident from Fig. 1 when compared to the tetragonal liquid state typical of the DI model in the square lattice shown by RA.

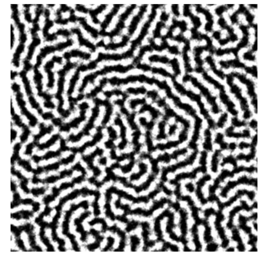

FIG. 1. Typical stripe liquid phase configuration in a Langevin simulation of the dipolar model with discretization mesh size 462^2. Note the isotropic character of the pattern.

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