

supplementary material for manuscript

Can off-centre mesogen dipoles extend the biaxial nematic range?

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$\langle T^* \rangle$	$\langle \rho^* \rangle$	$\langle E^* \rangle$	$\langle U_{\text{GB}}^* \rangle$	$\langle U_{\text{el}}^* \rangle$
2.60	0.348 ± 0.002	-8.70 ± 0.07	-16.4 ± 0.1	-0.110 ± 0.010
2.70	0.315 ± 0.003	-1.64 ± 0.04	-9.7 ± 0.2	-0.04 ± 0.01
2.80	0.300 ± 0.004	1.29 ± 0.04	-7.1 ± 0.1	-0.026 ± 0.009
2.90	0.292 ± 0.001	2.84 ± 0.05	-5.8 ± 0.1	-0.022 ± 0.008
3.00	0.285 ± 0.001	3.92 ± 0.04	-5.1 ± 0.1	-0.019 ± 0.008
3.10	0.279 ± 0.001	4.92 ± 0.05	-4.4 ± 0.1	-0.018 ± 0.008
3.20	0.272 ± 0.001	6.1 ± 0.1	-3.5 ± 0.2	-0.016 ± 0.007
3.30	0.266 ± 0.001	7.00 ± 0.05	-2.9 ± 0.1	-0.015 ± 0.007
3.40	0.263 ± 0.001	7.53 ± 0.05	-2.7 ± 0.1	-0.014 ± 0.007
3.50	0.260 ± 0.001	8.00 ± 0.04	-2.48 ± 0.10	-0.013 ± 0.007
3.60	0.257 ± 0.003	8.4 ± 0.1	-2.33 ± 0.10	-0.012 ± 0.007
$\langle T^* \rangle$	$\langle R_{0,0}^1 \rangle$	$\langle R_{0,0}^2 \rangle$	$\langle R_{0,0}^4 \rangle$	
2.60	0.000 ± 0.006	0.965 ± 0.006	0.890 ± 0.007	
2.70	-0.00 ± 0.03	0.88 ± 0.01	0.68 ± 0.01	
2.80	-0.00 ± 0.02	0.79 ± 0.02	0.51 ± 0.02	
2.90	-0.00 ± 0.03	0.73 ± 0.02	0.42 ± 0.02	
3.00	-0.00 ± 0.03	0.66 ± 0.02	0.33 ± 0.03	
3.10	-0.00 ± 0.02	0.57 ± 0.03	0.24 ± 0.03	
3.20	0.00 ± 0.02	0.39 ± 0.06	0.11 ± 0.04	
3.30	0.00 ± 0.02	0.16 ± 0.06	0.02 ± 0.02	
3.40	-0.00 ± 0.02	0.11 ± 0.04	0.01 ± 0.02	
3.50	0.00 ± 0.02	0.09 ± 0.03	0.01 ± 0.01	
3.60	-0.00 ± 0.02	0.07 ± 0.03	0.00 ± 0.01	
$\langle T^* \rangle$	$\langle R_{0,2}^2 \rangle$	$\langle R_{2,0}^2 \rangle$	$\langle R_{2,2}^2 \rangle$	
2.60	0.0068 ± 0.0007	0.0069 ± 0.0007	0.466 ± 0.003	
2.70	0.022 ± 0.002	0.020 ± 0.002	0.34 ± 0.01	
2.80	0.038 ± 0.004	0.032 ± 0.005	0.25 ± 0.02	
2.90	0.044 ± 0.005	0.022 ± 0.010	0.12 ± 0.04	
3.00	0.052 ± 0.006	0.02 ± 0.01	0.06 ± 0.03	
3.10	0.059 ± 0.007	0.02 ± 0.01	0.04 ± 0.02	
3.20	0.063 ± 0.009	0.02 ± 0.02	0.04 ± 0.02	
3.30	0.04 ± 0.02	0.01 ± 0.04	0.03 ± 0.01	
3.40	0.02 ± 0.01	0.00 ± 0.04	0.02 ± 0.01	
3.50	0.02 ± 0.01	0.00 ± 0.03	0.022 ± 0.010	
3.60	0.016 ± 0.009	-0.00 ± 0.03	0.020 ± 0.008	

Table 1: Average number density, total and potential energies, and orientational order parameters for the *ox* system with $\mu^* = 0.5$.

$\langle T^* \rangle$	$\langle \rho^* \rangle$	$\langle E^* \rangle$	$\langle U_{\text{GB}}^* \rangle$	$\langle U_{\text{el}}^* \rangle$
2.60	0.349 ± 0.003	-9.80 ± 0.10	-16.5 ± 0.2	-1.08 ± 0.03
2.70	0.342 ± 0.002	-8.63 ± 0.05	-15.7 ± 0.1	-1.08 ± 0.03
2.80	0.339 ± 0.003	-8.07 ± 0.07	-15.4 ± 0.2	-1.05 ± 0.03
2.90	0.291 ± 0.001	2.40 ± 0.07	-6.0 ± 0.1	-0.33 ± 0.03
3.00	0.284 ± 0.001	3.62 ± 0.05	-5.1 ± 0.1	-0.29 ± 0.03
3.10	0.278 ± 0.001	4.67 ± 0.07	-4.4 ± 0.1	-0.27 ± 0.03
3.20	0.270 ± 0.001	5.9 ± 0.1	-3.4 ± 0.2	-0.24 ± 0.02
3.30	0.265 ± 0.001	6.80 ± 0.05	-2.9 ± 0.1	-0.22 ± 0.02
3.40	0.262 ± 0.001	7.31 ± 0.04	-2.7 ± 0.1	-0.21 ± 0.02
3.50	0.259 ± 0.001	7.80 ± 0.05	-2.49 ± 0.10	-0.20 ± 0.02
3.60	0.257 ± 0.006	8.3 ± 0.2	-2.3 ± 0.1	-0.19 ± 0.02
$\langle T^* \rangle$	$\langle R_{0,0}^1 \rangle$	$\langle R_{0,0}^2 \rangle$	$\langle R_{0,0}^4 \rangle$	
2.60	-0.000 ± 0.004	0.965 ± 0.009	0.890 ± 0.010	
2.70	-0.000 ± 0.007	0.959 ± 0.005	0.873 ± 0.007	
2.80	-0.014 ± 0.002	0.959 ± 0.009	0.870 ± 0.009	
2.90	-0.00 ± 0.03	0.74 ± 0.02	0.43 ± 0.02	
3.00	-0.00 ± 0.03	0.66 ± 0.02	0.33 ± 0.03	
3.10	0.00 ± 0.03	0.57 ± 0.03	0.24 ± 0.03	
3.20	-0.00 ± 0.02	0.33 ± 0.08	0.09 ± 0.04	
3.30	-0.00 ± 0.02	0.14 ± 0.06	0.02 ± 0.02	
3.40	-0.00 ± 0.02	0.12 ± 0.04	0.01 ± 0.02	
3.50	0.00 ± 0.02	0.09 ± 0.03	0.01 ± 0.02	
3.60	-0.01 ± 0.02	0.07 ± 0.03	0.01 ± 0.01	
$\langle T^* \rangle$	$\langle R_{0,2}^2 \rangle$	$\langle R_{2,0}^2 \rangle$	$\langle R_{2,2}^2 \rangle$	
2.60	0.0070 ± 0.0007	0.0071 ± 0.0007	0.468 ± 0.005	
2.70	0.0072 ± 0.0008	0.0075 ± 0.0008	0.464 ± 0.003	
2.80	0.0068 ± 0.0008	0.0069 ± 0.0008	0.462 ± 0.004	
2.90	0.044 ± 0.005	0.025 ± 0.008	0.14 ± 0.04	
3.00	0.051 ± 0.006	0.02 ± 0.01	0.06 ± 0.03	
3.10	0.059 ± 0.007	0.02 ± 0.02	0.05 ± 0.02	
3.20	0.06 ± 0.01	0.03 ± 0.03	0.04 ± 0.02	
3.30	0.03 ± 0.02	0.01 ± 0.04	0.03 ± 0.01	
3.40	0.03 ± 0.01	0.00 ± 0.04	0.02 ± 0.01	
3.50	0.02 ± 0.01	0.00 ± 0.04	0.022 ± 0.010	
3.60	0.01 ± 0.01	-0.00 ± 0.03	0.018 ± 0.008	

Table 2: Average number density, total and potential energies, and orientational order parameters for the *ox* system with $\mu^* = 1.0$.

$\langle T^* \rangle$	$\langle \rho^* \rangle$	$\langle E^* \rangle$	$\langle U_{\text{GB}}^* \rangle$	$\langle U_{\text{el}}^* \rangle$
2.60	0.344 ± 0.009	-12.3 ± 0.3	-16.3 ± 0.4	-3.8 ± 0.1
2.70	0.342 ± 0.005	-11.5 ± 0.2	-15.9 ± 0.3	-3.70 ± 0.07
2.80	0.339 ± 0.002	-10.5 ± 0.1	-15.7 ± 0.1	-3.20 ± 0.07
2.90	0.337 ± 0.004	-9.9 ± 0.1	-15.1 ± 0.2	-3.43 ± 0.06
3.00	0.282 ± 0.001	2.42 ± 0.05	-5.3 ± 0.1	-1.30 ± 0.05
3.10	0.2758 ± 0.0009	3.70 ± 0.05	-4.4 ± 0.1	-1.17 ± 0.05
3.20	0.268 ± 0.001	5.1 ± 0.1	-3.4 ± 0.2	-1.04 ± 0.05
3.30	0.2629 ± 0.0009	6.05 ± 0.04	-2.9 ± 0.1	-0.97 ± 0.05
3.40	0.260 ± 0.001	6.60 ± 0.04	-2.7 ± 0.1	-0.92 ± 0.05
3.50	0.258 ± 0.001	7.10 ± 0.04	-2.50 ± 0.10	-0.89 ± 0.05
3.60	0.255 ± 0.001	7.58 ± 0.04	-2.36 ± 0.10	-0.85 ± 0.05
$\langle T^* \rangle$	$\langle R_{0,0}^1 \rangle$	$\langle R_{0,0}^2 \rangle$	$\langle R_{0,0}^4 \rangle$	
2.60	0.005 ± 0.003	0.96 ± 0.03	0.89 ± 0.02	
2.70	0.01 ± 0.03	0.96 ± 0.01	0.88 ± 0.01	
2.80	-0.019 ± 0.002	0.960 ± 0.006	0.875 ± 0.007	
2.90	0.023 ± 0.002	0.96 ± 0.01	0.86 ± 0.01	
3.00	0.00 ± 0.03	0.68 ± 0.02	0.35 ± 0.03	
3.10	0.00 ± 0.03	0.57 ± 0.03	0.24 ± 0.03	
3.20	-0.00 ± 0.02	0.34 ± 0.07	0.09 ± 0.03	
3.30	0.00 ± 0.02	0.13 ± 0.05	0.02 ± 0.02	
3.40	-0.00 ± 0.02	0.10 ± 0.04	0.01 ± 0.02	
3.50	-0.00 ± 0.02	0.08 ± 0.03	0.01 ± 0.02	
3.60	0.00 ± 0.02	0.08 ± 0.03	0.01 ± 0.01	
$\langle T^* \rangle$	$\langle R_{0,2}^2 \rangle$	$\langle R_{2,0}^2 \rangle$	$\langle R_{2,2}^2 \rangle$	
2.60	0.0064 ± 0.0007	0.0067 ± 0.0007	0.47 ± 0.01	
2.70	0.0066 ± 0.0007	0.0070 ± 0.0008	0.468 ± 0.007	
2.80	0.0068 ± 0.0007	0.0071 ± 0.0007	0.470 ± 0.003	
2.90	0.0072 ± 0.0008	0.0076 ± 0.0008	0.465 ± 0.005	
3.00	0.047 ± 0.005	0.016 ± 0.009	0.07 ± 0.03	
3.10	0.057 ± 0.007	0.02 ± 0.01	0.04 ± 0.02	
3.20	0.06 ± 0.01	0.02 ± 0.03	0.04 ± 0.02	
3.30	0.03 ± 0.01	0.01 ± 0.04	0.03 ± 0.01	
3.40	0.02 ± 0.01	0.00 ± 0.04	0.02 ± 0.01	
3.50	0.02 ± 0.01	-0.00 ± 0.03	0.021 ± 0.009	
3.60	0.02 ± 0.01	-0.00 ± 0.03	0.019 ± 0.008	

Table 3: Average number density, total and potential energies, and orientational order parameters for the ox system with $\mu^* = 1.5$.

$\langle T^* \rangle$	$\langle \rho^* \rangle$	$\langle E^* \rangle$	$\langle U_{\text{GB}}^* \rangle$	$\langle U_{\text{el}}^* \rangle$
2.6	0.35 ± 0.02	-8.5 ± 0.5	-16.2 ± 0.9	-0.020 ± 0.006
2.70	0.314 ± 0.009	-1.56 ± 0.07	-9.6 ± 0.3	-0.024 ± 0.008
2.8	0.30 ± 0.01	1.37 ± 0.06	-7.0 ± 0.3	-0.019 ± 0.007
2.90	0.292 ± 0.007	2.84 ± 0.07	-5.8 ± 0.2	-0.016 ± 0.007
3.00	0.285 ± 0.006	3.93 ± 0.10	-5.0 ± 0.2	-0.015 ± 0.006
3.10	0.279 ± 0.006	5.0 ± 0.1	-4.3 ± 0.2	-0.014 ± 0.006
3.2	0.27 ± 0.02	6.0 ± 0.3	-3.6 ± 0.2	-0.014 ± 0.006
3.3	0.27 ± 0.01	7.0 ± 0.3	-2.9 ± 0.2	-0.013 ± 0.006
3.4	0.26 ± 0.01	7.5 ± 0.4	-2.6 ± 0.2	-0.012 ± 0.006
3.5	0.26 ± 0.01	8.0 ± 0.4	-2.5 ± 0.2	-0.011 ± 0.006
3.6	0.26 ± 0.01	8.4 ± 0.4	-2.3 ± 0.2	-0.011 ± 0.006
$\langle T^* \rangle$	$\langle R_{0,0}^1 \rangle$	$\langle R_{0,0}^2 \rangle$	$\langle R_{0,0}^4 \rangle$	
2.6	-0.001 ± 0.008	0.96 ± 0.05	0.88 ± 0.05	
2.70	-0.00 ± 0.02	0.88 ± 0.03	0.68 ± 0.02	
2.8	-0.01 ± 0.02	0.79 ± 0.03	0.50 ± 0.03	
2.90	0.00 ± 0.02	0.73 ± 0.02	0.42 ± 0.03	
3.00	-0.01 ± 0.03	0.66 ± 0.03	0.33 ± 0.03	
3.10	0.01 ± 0.02	0.57 ± 0.03	0.24 ± 0.03	
3.2	-0.01 ± 0.03	0.41 ± 0.06	0.12 ± 0.04	
3.3	0.00 ± 0.02	0.17 ± 0.05	0.02 ± 0.02	
3.4	0.00 ± 0.02	0.12 ± 0.04	0.01 ± 0.02	
3.5	0.00 ± 0.02	0.11 ± 0.04	0.01 ± 0.02	
3.6	0.00 ± 0.02	0.09 ± 0.03	0.01 ± 0.01	
$\langle T^* \rangle$	$\langle R_{0,2}^2 \rangle$	$\langle R_{2,0}^2 \rangle$	$\langle R_{2,2}^2 \rangle$	
2.6	0.0066 ± 0.0008	0.0066 ± 0.0008	0.46 ± 0.03	
2.70	0.022 ± 0.002	0.020 ± 0.003	0.34 ± 0.02	
2.8	0.039 ± 0.004	0.032 ± 0.006	0.24 ± 0.02	
2.90	0.044 ± 0.005	0.022 ± 0.009	0.12 ± 0.04	
3.00	0.051 ± 0.006	0.02 ± 0.01	0.06 ± 0.03	
3.10	0.060 ± 0.007	0.02 ± 0.01	0.04 ± 0.02	
3.2	0.061 ± 0.009	0.02 ± 0.02	0.03 ± 0.02	
3.3	0.04 ± 0.01	0.01 ± 0.04	0.03 ± 0.01	
3.4	0.03 ± 0.01	0.00 ± 0.04	0.024 ± 0.009	
3.5	0.02 ± 0.01	-0.00 ± 0.03	0.021 ± 0.009	
3.6	0.02 ± 0.01	-0.00 ± 0.03	0.020 ± 0.009	

Table 4: Average number density, total and potential energies, and orientational order parameters for the *ot* system with $\mu^* = 0.5$.

$\langle T^* \rangle$	$\langle \rho^* \rangle$	$\langle E^* \rangle$	$\langle U_{\text{GB}}^* \rangle$	$\langle U_{\text{el}}^* \rangle$
2.6	0.34 ± 0.01	-8.6 ± 0.4	-15.8 ± 0.7	-0.54 ± 0.03
2.69	0.316 ± 0.008	-2.56 ± 0.09	-10.2 ± 0.3	-0.42 ± 0.03
2.80	0.301 ± 0.007	0.82 ± 0.07	-7.3 ± 0.2	-0.30 ± 0.03
2.90	0.291 ± 0.007	2.57 ± 0.08	-5.9 ± 0.2	-0.26 ± 0.03
3.00	0.285 ± 0.007	3.72 ± 0.10	-5.0 ± 0.2	-0.23 ± 0.03
3.10	0.278 ± 0.008	4.7 ± 0.1	-4.3 ± 0.2	-0.22 ± 0.03
3.20	0.271 ± 0.006	6.0 ± 0.2	-3.4 ± 0.2	-0.20 ± 0.02
3.30	0.266 ± 0.006	6.8 ± 0.2	-2.9 ± 0.1	-0.18 ± 0.02
3.4	0.26 ± 0.02	7.3 ± 0.4	-2.7 ± 0.2	-0.17 ± 0.02
3.5	0.259 ± 0.009	7.8 ± 0.3	-2.5 ± 0.1	-0.17 ± 0.02
3.6	0.26 ± 0.02	8.3 ± 0.5	-2.3 ± 0.2	-0.16 ± 0.03
$\langle T^* \rangle$	$\langle R_{0,0}^1 \rangle$	$\langle R_{0,0}^2 \rangle$	$\langle R_{0,0}^4 \rangle$	
2.6	-0.006 ± 0.008	0.96 ± 0.04	0.88 ± 0.04	
2.69	0.00 ± 0.01	0.90 ± 0.02	0.71 ± 0.02	
2.80	-0.01 ± 0.02	0.80 ± 0.02	0.53 ± 0.03	
2.90	-0.00 ± 0.02	0.73 ± 0.02	0.42 ± 0.03	
3.00	-0.01 ± 0.02	0.66 ± 0.03	0.33 ± 0.03	
3.10	-0.00 ± 0.02	0.57 ± 0.03	0.24 ± 0.03	
3.20	0.00 ± 0.02	0.35 ± 0.06	0.09 ± 0.03	
3.30	0.00 ± 0.02	0.17 ± 0.07	0.03 ± 0.02	
3.4	0.00 ± 0.02	0.12 ± 0.04	0.01 ± 0.02	
3.5	0.00 ± 0.02	0.08 ± 0.03	0.01 ± 0.02	
3.6	-0.00 ± 0.02	0.09 ± 0.03	0.01 ± 0.02	
$\langle T^* \rangle$	$\langle R_{0,2}^2 \rangle$	$\langle R_{2,0}^2 \rangle$	$\langle R_{2,2}^2 \rangle$	
2.6	0.0065 ± 0.0008	0.0067 ± 0.0008	0.46 ± 0.02	
2.69	0.019 ± 0.002	0.018 ± 0.002	0.35 ± 0.01	
2.80	0.036 ± 0.004	0.030 ± 0.005	0.25 ± 0.02	
2.90	0.045 ± 0.005	0.026 ± 0.010	0.14 ± 0.04	
3.00	0.051 ± 0.006	0.02 ± 0.01	0.06 ± 0.03	
3.10	0.060 ± 0.007	0.02 ± 0.01	0.04 ± 0.02	
3.20	0.06 ± 0.01	0.02 ± 0.03	0.03 ± 0.02	
3.30	0.04 ± 0.02	0.01 ± 0.04	0.03 ± 0.01	
3.4	0.03 ± 0.01	0.01 ± 0.05	0.03 ± 0.01	
3.5	0.02 ± 0.01	-0.00 ± 0.03	0.021 ± 0.009	
3.6	0.02 ± 0.01	-0.00 ± 0.03	0.019 ± 0.008	

Table 5: Average number density, total and potential energies, and orientational order parameters for the *ot* system with $\mu^* = 1.0$.

$\langle T^* \rangle$	$\langle \rho^* \rangle$	$\langle E^* \rangle$	$\langle U_{\text{GB}}^* \rangle$	$\langle U_{\text{el}}^* \rangle$
2.6	0.34 ± 0.02	-10.7 ± 0.5	-15.4 ± 0.8	-3.1 ± 0.2
2.7	0.34 ± 0.01	-9.9 ± 0.4	-14.9 ± 0.7	-3.0 ± 0.1
2.8	0.33 ± 0.02	-8.1 ± 0.4	-13.6 ± 0.7	-2.9 ± 0.2
2.90	0.291 ± 0.009	1.31 ± 0.06	-6.1 ± 0.2	-1.26 ± 0.07
3.0	0.28 ± 0.01	2.7 ± 0.1	-5.1 ± 0.2	-1.13 ± 0.07
3.1	0.28 ± 0.01	4.0 ± 0.2	-4.3 ± 0.2	-1.04 ± 0.07
3.2	0.27 ± 0.01	5.2 ± 0.3	-3.4 ± 0.2	-0.95 ± 0.07
3.3	0.264 ± 0.009	6.1 ± 0.2	-2.9 ± 0.2	-0.89 ± 0.06
3.4	0.26 ± 0.01	6.7 ± 0.3	-2.6 ± 0.2	-0.85 ± 0.07
3.5	0.259 ± 0.010	7.2 ± 0.3	-2.5 ± 0.1	-0.80 ± 0.06
3.6	0.256 ± 0.010	7.7 ± 0.3	-2.3 ± 0.1	-0.77 ± 0.06
$\langle T^* \rangle$	$\langle R_{0,0}^1 \rangle$	$\langle R_{0,0}^2 \rangle$	$\langle R_{0,0}^4 \rangle$	
2.6	-0.0097 ± 0.0006	0.96 ± 0.05	0.88 ± 0.04	
2.7	0.0155 ± 0.0008	0.96 ± 0.04	0.87 ± 0.04	
2.8	0.0039 ± 0.0007	0.95 ± 0.05	0.84 ± 0.04	
2.90	0.01 ± 0.03	0.74 ± 0.03	0.44 ± 0.03	
3.0	0.01 ± 0.03	0.67 ± 0.03	0.34 ± 0.03	
3.1	-0.00 ± 0.02	0.56 ± 0.03	0.23 ± 0.03	
3.2	0.01 ± 0.02	0.35 ± 0.06	0.09 ± 0.03	
3.3	-0.00 ± 0.02	0.14 ± 0.06	0.02 ± 0.02	
3.4	0.00 ± 0.02	0.09 ± 0.04	0.01 ± 0.02	
3.5	0.00 ± 0.02	0.09 ± 0.03	0.01 ± 0.02	
3.6	0.00 ± 0.02	0.08 ± 0.03	0.01 ± 0.01	
$\langle T^* \rangle$	$\langle R_{0,2}^2 \rangle$	$\langle R_{2,0}^2 \rangle$	$\langle R_{2,2}^2 \rangle$	
2.6	0.0063 ± 0.0007	0.0065 ± 0.0007	0.46 ± 0.02	
2.7	0.0070 ± 0.0007	0.0072 ± 0.0008	0.46 ± 0.02	
2.8	0.0079 ± 0.0010	0.0079 ± 0.0010	0.44 ± 0.02	
2.90	0.043 ± 0.005	0.026 ± 0.008	0.15 ± 0.03	
3.0	0.051 ± 0.005	0.015 ± 0.010	0.06 ± 0.03	
3.1	0.060 ± 0.007	0.01 ± 0.01	0.04 ± 0.02	
3.2	0.06 ± 0.01	0.02 ± 0.03	0.03 ± 0.02	
3.3	0.03 ± 0.02	0.01 ± 0.04	0.03 ± 0.01	
3.4	0.02 ± 0.01	-0.00 ± 0.03	0.021 ± 0.008	
3.5	0.02 ± 0.01	-0.00 ± 0.03	0.021 ± 0.009	
3.6	0.02 ± 0.01	0.00 ± 0.03	0.020 ± 0.009	

Table 6: Average number density, total and potential energies, and orientational order parameters for the *ot* system with $\mu^* = 1.5$.

$\langle T^* \rangle$	$\langle \rho^* \rangle$	$\langle E^* \rangle$	$\langle U_{\text{GB}}^* \rangle$	$\langle U_{\text{el}}^* \rangle$
2.60	0.347 ± 0.008	-8.1 ± 0.2	-16.1 ± 0.4	0.209 ± 0.007
2.7	0.31 ± 0.01	-0.70 ± 0.07	-8.8 ± 0.3	0.045 ± 0.009
2.80	0.300 ± 0.007	1.55 ± 0.07	-6.8 ± 0.2	0.012 ± 0.006
2.90	0.291 ± 0.007	2.94 ± 0.09	-5.8 ± 0.2	0.007 ± 0.006
3.0	0.285 ± 0.009	4.0 ± 0.1	-5.0 ± 0.2	0.005 ± 0.005
3.10	0.279 ± 0.006	5.0 ± 0.1	-4.3 ± 0.2	0.004 ± 0.005
3.19	0.271 ± 0.008	6.1 ± 0.2	-3.5 ± 0.2	0.004 ± 0.005
3.30	0.266 ± 0.003	7.04 ± 0.09	-2.9 ± 0.1	0.003 ± 0.005
3.40	0.263 ± 0.004	7.6 ± 0.1	-2.6 ± 0.1	0.003 ± 0.005
3.50	0.260 ± 0.003	8.0 ± 0.1	-2.5 ± 0.1	0.003 ± 0.005
3.60	0.257 ± 0.003	8.5 ± 0.1	-2.3 ± 0.1	0.003 ± 0.004
$\langle T^* \rangle$	$\langle R_{0,0}^1 \rangle$	$\langle R_{0,0}^2 \rangle$	$\langle R_{0,0}^4 \rangle$	
2.60	0.000 ± 0.004	0.96 ± 0.02	0.89 ± 0.02	
2.7	0.01 ± 0.02	0.86 ± 0.03	0.64 ± 0.03	
2.80	0.01 ± 0.02	0.78 ± 0.02	0.49 ± 0.03	
2.90	0.00 ± 0.03	0.72 ± 0.02	0.41 ± 0.02	
3.0	0.01 ± 0.02	0.66 ± 0.03	0.33 ± 0.03	
3.10	0.00 ± 0.02	0.57 ± 0.03	0.24 ± 0.03	
3.19	0.00 ± 0.02	0.38 ± 0.05	0.10 ± 0.03	
3.30	-0.00 ± 0.02	0.14 ± 0.05	0.02 ± 0.02	
3.40	-0.00 ± 0.02	0.11 ± 0.04	0.01 ± 0.02	
3.50	-0.00 ± 0.02	0.09 ± 0.03	0.01 ± 0.02	
3.60	0.00 ± 0.02	0.08 ± 0.03	0.00 ± 0.01	
$\langle T^* \rangle$	$\langle R_{0,2}^2 \rangle$	$\langle R_{2,0}^2 \rangle$	$\langle R_{2,2}^2 \rangle$	
2.60	0.0069 ± 0.0007	0.0070 ± 0.0007	0.46 ± 0.01	
2.7	0.026 ± 0.003	0.024 ± 0.003	0.32 ± 0.02	
2.80	0.040 ± 0.004	0.033 ± 0.006	0.24 ± 0.02	
2.90	0.046 ± 0.005	0.025 ± 0.008	0.13 ± 0.04	
3.0	0.051 ± 0.006	0.02 ± 0.01	0.06 ± 0.03	
3.10	0.060 ± 0.007	0.02 ± 0.01	0.04 ± 0.02	
3.19	0.062 ± 0.010	0.02 ± 0.03	0.03 ± 0.02	
3.30	0.03 ± 0.01	0.01 ± 0.05	0.03 ± 0.01	
3.40	0.02 ± 0.01	0.00 ± 0.04	0.02 ± 0.01	
3.50	0.02 ± 0.01	-0.00 ± 0.04	0.022 ± 0.009	
3.60	0.02 ± 0.01	-0.00 ± 0.03	0.021 ± 0.008	

Table 7: Average number density, total and potential energies, and orientational order parameters for the oz system with $\mu^* = 0.5$.

$\langle T^* \rangle$	$\langle \rho^* \rangle$	$\langle E^* \rangle$	$\langle U_{\text{GB}}^* \rangle$	$\langle U_{\text{el}}^* \rangle$
2.60	0.339 ± 0.009	-6.3 ± 0.2	-14.6 ± 0.4	0.49 ± 0.03
2.70	0.306 ± 0.008	0.49 ± 0.03	-7.5 ± 0.2	-0.10 ± 0.02
2.80	0.299 ± 0.006	1.71 ± 0.05	-6.6 ± 0.2	-0.09 ± 0.02
2.90	0.291 ± 0.008	2.99 ± 0.09	-5.6 ± 0.2	-0.09 ± 0.02
3.00	0.285 ± 0.007	4.0 ± 0.1	-4.9 ± 0.2	-0.08 ± 0.02
3.10	0.279 ± 0.007	5.0 ± 0.1	-4.2 ± 0.2	-0.08 ± 0.02
3.20	0.272 ± 0.007	6.0 ± 0.2	-3.5 ± 0.2	-0.07 ± 0.02
3.30	0.266 ± 0.003	6.97 ± 0.08	-2.9 ± 0.1	-0.06 ± 0.02
3.40	0.263 ± 0.003	7.5 ± 0.1	-2.6 ± 0.1	-0.06 ± 0.02
3.50	0.260 ± 0.004	8.0 ± 0.1	-2.4 ± 0.1	-0.05 ± 0.02
3.60	0.257 ± 0.002	8.43 ± 0.08	-2.31 ± 0.10	-0.05 ± 0.02
$\langle T^* \rangle$	$\langle R_{0,0}^1 \rangle$	$\langle R_{0,0}^2 \rangle$	$\langle R_{0,0}^4 \rangle$	
2.60	0.000 ± 0.006	0.95 ± 0.02	0.85 ± 0.02	
2.70	-0.01 ± 0.03	0.81 ± 0.02	0.55 ± 0.03	
2.80	-0.02 ± 0.03	0.77 ± 0.02	0.48 ± 0.02	
2.90	0.00 ± 0.03	0.72 ± 0.03	0.40 ± 0.03	
3.00	-0.00 ± 0.02	0.66 ± 0.03	0.33 ± 0.03	
3.10	-0.01 ± 0.02	0.57 ± 0.03	0.23 ± 0.03	
3.20	0.00 ± 0.02	0.42 ± 0.05	0.13 ± 0.03	
3.30	-0.00 ± 0.02	0.16 ± 0.06	0.02 ± 0.02	
3.40	-0.00 ± 0.02	0.10 ± 0.04	0.01 ± 0.02	
3.50	0.00 ± 0.02	0.09 ± 0.03	0.01 ± 0.01	
3.60	-0.00 ± 0.02	0.08 ± 0.03	0.01 ± 0.01	
$\langle T^* \rangle$	$\langle R_{0,2}^2 \rangle$	$\langle R_{2,0}^2 \rangle$	$\langle R_{2,2}^2 \rangle$	
2.60	0.009 ± 0.001	0.010 ± 0.001	0.45 ± 0.01	
2.70	0.036 ± 0.004	0.032 ± 0.005	0.28 ± 0.02	
2.80	0.041 ± 0.005	0.033 ± 0.006	0.23 ± 0.02	
2.90	0.046 ± 0.005	0.024 ± 0.009	0.12 ± 0.04	
3.00	0.052 ± 0.006	0.02 ± 0.01	0.06 ± 0.03	
3.10	0.060 ± 0.007	0.02 ± 0.01	0.04 ± 0.02	
3.20	0.064 ± 0.009	0.02 ± 0.02	0.04 ± 0.02	
3.30	0.04 ± 0.02	0.01 ± 0.04	0.03 ± 0.01	
3.40	0.02 ± 0.01	0.00 ± 0.04	0.024 ± 0.009	
3.50	0.02 ± 0.01	-0.00 ± 0.03	0.020 ± 0.008	
3.60	0.02 ± 0.01	-0.00 ± 0.03	0.020 ± 0.009	

Table 8: Average number density, total and potential energies, and orientational order parameters for the oz system with $\mu^* = 1.0$.

$\langle T^* \rangle$	$\langle \rho^* \rangle$	$\langle E^* \rangle$	$\langle U_{\text{GB}}^* \rangle$	$\langle U_{\text{el}}^* \rangle$
2.1	0.36 ± 0.01	-11.5 ± 0.8	-15.4 ± 0.1	-1.46 ± 0.05
2.2	0.35 ± 0.02	-9.6 ± 0.4	-14.6 ± 0.7	-1.61 ± 0.09
2.29	0.33 ± 0.01	-4.6 ± 0.2	-10.6 ± 0.4	-0.86 ± 0.06
2.40	0.324 ± 0.005	-3.32 ± 0.06	-9.7 ± 0.2	-0.82 ± 0.05
2.50	0.318 ± 0.005	-2.16 ± 0.05	-8.9 ± 0.2	-0.76 ± 0.05
2.60	0.311 ± 0.005	-1.03 ± 0.03	-8.1 ± 0.2	-0.71 ± 0.04
2.70	0.305 ± 0.005	0.13 ± 0.04	-7.3 ± 0.2	-0.66 ± 0.04
2.80	0.298 ± 0.008	1.36 ± 0.06	-6.4 ± 0.2	-0.60 ± 0.04
2.90	0.291 ± 0.003	2.59 ± 0.05	-5.6 ± 0.1	-0.54 ± 0.04
3.00	0.285 ± 0.003	3.59 ± 0.05	-4.9 ± 0.1	-0.51 ± 0.04
3.10	0.279 ± 0.003	4.57 ± 0.06	-4.3 ± 0.1	-0.46 ± 0.04
3.20	0.272 ± 0.003	5.7 ± 0.1	-3.5 ± 0.2	-0.41 ± 0.04
3.30	0.266 ± 0.003	6.64 ± 0.09	-2.9 ± 0.1	-0.38 ± 0.03
3.40	0.262 ± 0.003	7.2 ± 0.1	-2.6 ± 0.1	-0.35 ± 0.04
3.50	0.260 ± 0.003	7.73 ± 0.09	-2.4 ± 0.1	-0.33 ± 0.04
3.60	0.257 ± 0.005	8.2 ± 0.2	-2.3 ± 0.1	-0.32 ± 0.04
$\langle T^* \rangle$	$\langle R_{0,0}^1 \rangle$	$\langle R_{0,0}^2 \rangle$	$\langle R_{0,0}^4 \rangle$	
2.1	-0.013 ± 0.004	0.90 ± 0.03	0.80 ± 0.03	
2.2	0.009 ± 0.003	0.90 ± 0.04	0.80 ± 0.04	
2.29	0.018 ± 0.004	0.91 ± 0.03	0.74 ± 0.03	
2.40	-0.01 ± 0.02	0.89 ± 0.02	0.69 ± 0.02	
2.50	0.04 ± 0.02	0.87 ± 0.02	0.64 ± 0.02	
2.60	0.01 ± 0.01	0.84 ± 0.02	0.59 ± 0.02	
2.70	-0.01 ± 0.02	0.81 ± 0.02	0.54 ± 0.02	
2.80	0.01 ± 0.03	0.77 ± 0.02	0.48 ± 0.02	
2.90	0.01 ± 0.03	0.72 ± 0.02	0.40 ± 0.03	
3.00	-0.00 ± 0.03	0.67 ± 0.02	0.33 ± 0.02	
3.10	0.01 ± 0.02	0.58 ± 0.02	0.25 ± 0.03	
3.20	0.00 ± 0.02	0.39 ± 0.09	0.12 ± 0.04	
3.30	-0.00 ± 0.02	0.20 ± 0.07	0.03 ± 0.03	
3.40	0.00 ± 0.02	0.11 ± 0.05	0.01 ± 0.02	
3.50	-0.00 ± 0.02	0.09 ± 0.04	0.01 ± 0.01	
3.60	-0.00 ± 0.02	0.07 ± 0.03	0.01 ± 0.01	
$\langle T^* \rangle$	$\langle R_{0,2}^2 \rangle$	$\langle R_{2,0}^2 \rangle$	$\langle R_{2,2}^2 \rangle$	
2.1	0.005 ± 0.002	0.005 ± 0.002	0.4 ± 0.1	
2.2	0.004 ± 0.001	0.004 ± 0.002	0.4 ± 0.1	
2.29	0.019 ± 0.002	0.018 ± 0.002	0.39 ± 0.02	
2.40	0.023 ± 0.002	0.022 ± 0.002	0.379 ± 0.010	
2.50	0.027 ± 0.003	0.026 ± 0.003	0.35 ± 0.01	
2.60	0.032 ± 0.003	0.030 ± 0.004	0.33 ± 0.01	
2.70	0.036 ± 0.004	0.032 ± 0.004	0.28 ± 0.02	
2.80	0.041 ± 0.005	0.033 ± 0.006	0.22 ± 0.02	
2.90	0.046 ± 0.005	0.025 ± 0.010	0.13 ± 0.04	
3.00	0.051 ± 0.006	0.02 ± 0.01	0.06 ± 0.03	
3.10	0.059 ± 0.006	0.02 ± 0.01	0.04 ± 0.02	
3.20	0.06 ± 0.01	0.03 ± 0.03	0.04 ± 0.02	
3.30	0.04 ± 0.02	0.01 ± 0.04	0.03 ± 0.01	
3.40	0.03 ± 0.01	0.01 ± 0.05	0.03 ± 0.01	
3.50	0.02 ± 0.01	-0.00 ± 0.03	0.020 ± 0.009	
3.60	0.02 ± 0.01	0.00 ± 0.03	0.02 ± 0.01	

Table 9: Average number density, total and potential energies, and orientational order parameters for the *oz* system with $\mu^* = 1.5$.

$\langle T^* \rangle$	$\langle \rho^* \rangle$	$\langle E^* \rangle$	$\langle U_{\text{GB}}^* \rangle$	$\langle U_{\text{el}}^* \rangle$
2.10	0.350 ± 0.008	-14.3 ± 0.3	-14.4 ± 0.3	-6.2 ± 0.1
2.20	0.354 ± 0.003	-14.9 ± 0.1	-14.8 ± 0.1	-6.67 ± 0.08
2.30	0.351 ± 0.004	-14.0 ± 0.1	-14.3 ± 0.2	-6.60 ± 0.09
2.40	0.349 ± 0.010	-13.4 ± 0.4	-14.2 ± 0.4	-6.4 ± 0.2
2.5	0.35 ± 0.01	-12.8 ± 0.5	-14.0 ± 0.6	-6.3 ± 0.3
2.60	0.310 ± 0.005	-2.65 ± 0.06	-8.1 ± 0.2	-2.32 ± 0.08
2.70	0.304 ± 0.007	-1.31 ± 0.05	-7.3 ± 0.2	-2.09 ± 0.08
2.80	0.297 ± 0.007	0.01 ± 0.05	-6.5 ± 0.2	-1.90 ± 0.08
2.90	0.290 ± 0.005	1.39 ± 0.07	-5.6 ± 0.2	-1.71 ± 0.07
3.00	0.284 ± 0.006	2.45 ± 0.07	-5.0 ± 0.2	-1.58 ± 0.07
3.10	0.278 ± 0.008	3.5 ± 0.1	-4.3 ± 0.2	-1.45 ± 0.08
3.20	0.272 ± 0.008	4.6 ± 0.1	-3.7 ± 0.2	-1.32 ± 0.07
3.3	0.265 ± 0.010	5.9 ± 0.2	-2.8 ± 0.2	-1.17 ± 0.07
3.39	0.261 ± 0.007	6.5 ± 0.2	-2.6 ± 0.1	-1.11 ± 0.06
3.50	0.259 ± 0.006	7.0 ± 0.2	-2.4 ± 0.1	-1.06 ± 0.06
3.60	0.256 ± 0.005	7.5 ± 0.2	-2.3 ± 0.1	-1.01 ± 0.06
$\langle T^* \rangle$	$\langle R_{0,0}^1 \rangle$	$\langle R_{0,0}^2 \rangle$	$\langle R_{0,0}^4 \rangle$	
2.10	-0.0154 ± 0.0005	0.97 ± 0.02	0.91 ± 0.02	
2.20	-0.0155 ± 0.0004	0.975 ± 0.009	0.921 ± 0.009	
2.30	-0.0115 ± 0.0004	0.97 ± 0.01	0.91 ± 0.01	
2.40	-0.0194 ± 0.0007	0.97 ± 0.03	0.91 ± 0.03	
2.5	0.023 ± 0.001	0.97 ± 0.04	0.91 ± 0.04	
2.60	0.01 ± 0.02	0.85 ± 0.02	0.62 ± 0.02	
2.70	0.02 ± 0.02	0.82 ± 0.02	0.56 ± 0.02	
2.80	-0.03 ± 0.02	0.79 ± 0.02	0.50 ± 0.02	
2.90	-0.02 ± 0.02	0.74 ± 0.02	0.42 ± 0.02	
3.00	-0.01 ± 0.02	0.69 ± 0.02	0.36 ± 0.03	
3.10	-0.00 ± 0.02	0.62 ± 0.03	0.28 ± 0.02	
3.20	-0.00 ± 0.02	0.50 ± 0.03	0.18 ± 0.02	
3.3	0.00 ± 0.02	0.20 ± 0.06	0.03 ± 0.02	
3.39	-0.00 ± 0.02	0.12 ± 0.04	0.01 ± 0.02	
3.50	-0.00 ± 0.02	0.11 ± 0.04	0.01 ± 0.02	
3.60	0.00 ± 0.02	0.09 ± 0.03	0.01 ± 0.02	
$\langle T^* \rangle$	$\langle R_{0,2}^2 \rangle$	$\langle R_{2,0}^2 \rangle$	$\langle R_{2,2}^2 \rangle$	
2.10	0.0051 ± 0.0005	0.0052 ± 0.0005	0.47 ± 0.01	
2.20	0.0048 ± 0.0004	0.0049 ± 0.0004	0.476 ± 0.004	
2.30	0.0044 ± 0.0005	0.0047 ± 0.0006	0.475 ± 0.005	
2.40	0.0057 ± 0.0005	0.0059 ± 0.0006	0.47 ± 0.01	
2.5	0.0060 ± 0.0006	0.0062 ± 0.0006	0.47 ± 0.02	
2.60	0.029 ± 0.003	0.028 ± 0.003	0.34 ± 0.01	
2.70	0.035 ± 0.004	0.031 ± 0.005	0.29 ± 0.02	
2.80	0.039 ± 0.004	0.031 ± 0.006	0.23 ± 0.02	
2.90	0.043 ± 0.005	0.024 ± 0.008	0.14 ± 0.04	
3.00	0.048 ± 0.005	0.02 ± 0.01	0.09 ± 0.04	
3.10	0.054 ± 0.006	0.01 ± 0.01	0.04 ± 0.03	
3.20	0.061 ± 0.008	0.01 ± 0.02	0.03 ± 0.02	
3.3	0.04 ± 0.01	0.02 ± 0.04	0.03 ± 0.01	
3.39	0.03 ± 0.01	0.00 ± 0.04	0.02 ± 0.01	
3.50	0.02 ± 0.01	0.00 ± 0.03	0.022 ± 0.010	
3.60	0.02 ± 0.01	0.01 ± 0.04	0.02 ± 0.01	

Table 10: Average number density, total and potential energies, and orientational order parameters for the oz system with $\mu^* = 2.0$.