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Erratum: Multimedia Dispersion Relation for Surface Electromagnetic Waves. (The Journal of Chemical Physics (1975) 62 (1674))

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distances are small to obtain the effect of the local density. At small distances it is observed that while $u^{(2)}$ varies with the density, $\nabla(\ln g^{(2)}+u^{(2)})$ is always small. This means that $\nabla u_{ij}^{(2)}$ depends on the other $(N-2)$ particles in the system only through $\nabla \ln g^{(2)}$. It then seems reasonable to assume that at small distances the distribution of the other $(N-3)$ particles in the system will not alter $\nabla u^{(3)}$ appreciably and that we may neglect the terms explicitly containing the density in Eq. (4). To be consistent, we must use a similar approximation for $\nabla u^{(2)}$ where it appears in Eq. (4). This is $\nabla u^{(2)} \cong -\nabla g^{(2)}/g^{(2)}$, which is an excellent representation at small distances. With these approximations Eq. (4) can be solved to obtain the symmetric result which is exact in the limit of zero density.

$$u_{123}^{(3)} \cong -\ln(g_{123}^{(3)}/g_{12}^{(2)}g_{13}^{(2)}g_{23}^{(2)}) . \quad (5)$$

This form of $u^{(3)}$ vanishes very rapidly when any one of the three distances becomes large. This makes Monte Carlo calculations using it relatively easy.[4] The effect of $u^{(3)}$ is to discourage linear configurations and to enhance the probability of finding three particles in triangles with one angle approximately 90°.

This method can be easily extended to approximate $u^{(4)}$

$$u_{1234}^{(4)} \cong -\ln\left(g_{1234}^{(4)} \prod_{i<j}^{4} g_{ij}^{(2)}/g_{123}^{(3)}g_{124}^{(3)}g_{134}^{(3)}g_{234}^{(3)}\right) \quad (6)$$

and similarly to approximate $u^{(n)}$. In the limit as $n \to N$ and using $u^{(2)}=-\ln g^{(2)}$, we get $U=-\ln g^{(N)}$ exactly.

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ERRATA

Erratum: Multimedia dispersion relation for surface electromagnetic waves [J. Chem. Phys. 62, 1674 (1975)]

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A minor mathematical error was made in expressing the results in a compact form in Eq. (3). The entire equation and conditions should be deleted and replaced with the following:

$$A_{p,m}=\sin^2(\tfrac{1}{2}\pi\gamma_{p,m}) ,$$

with

$$\gamma_{p,m}=\tfrac{1}{2}\gamma_{p,m-1}-\tfrac{1}{4}[1-(1)^{\gamma_{p,m-1}}]+(p-1)\delta_m ,$$

where

$$\delta_m=\begin{cases}1, & m=2\\ 0, & m\neq 2\end{cases}$$

$$\gamma_{p,0}=0 .$$

This change does not affect the general derivation or results as shown in Fig. 2. The authors would like to thank Dr. R. T. Holm for pointing out the discrepancy.

