
Maxim A. Yurkina,b, Alfons G. Hoekstrac,d

a Voevodsky Institute of Chemical Kinetics and Combustion SB RAS, Institutskaya Str. 3, 630090 Novosibirsk, Russia
b Novosibirsk State University, Pirogova Str. 2, 630090 Novosibirsk, Russia
c Computational Science Laboratory, University of Amsterdam, Science Park 904, 1098 XH Amsterdam, The Netherlands
d ITMO University, Kronverksky prospekt 49, 197101 St. Petersburg, Russia

The review [1] is still widely used as a general reference to the discrete dipole approximation, which motivates keeping it as accurate as possible. In the following we correct several errors, mostly typographical ones, which were uncovered over the years.

There was a sign error in Eq. (5)

\[ L(\partial V_0; r) = \int d^2 r \frac{\nabla \hat{R}}{R^2} \]  

In the first line of paragraph before Eq. (7) the subscript \( i \) should be added to the right-hand-side of the discretization definition; the corrected expression is

\[ V = \bigcup_{i=1}^{N} V_i. \]

In the denominator of the fraction inside the second integral in Eq. (51) “\( R^3 \)” should be replaced by “\( R^5 \)” leading to

\[ M_\nu(V_i) = \sum_{\nu} M_{\nu,\mu}^0 E_\mu + \frac{1}{V_i} \int d^3 R \frac{\exp(i k R)}{R^5} \left( k^2 R^2 + i k R - 1 \right) \sum_{\nu} \nabla^2 R^2 \nabla^2 E_\nu - \frac{1}{2} \int d^3 R \frac{\exp(i k R)}{R^5} \left( k^2 R^2 + 3 i k R - 3 \right) \sum_{\nu \rho \tau} R\nu R\rho R\tau \partial^2 \chi E_\nu + O(1d^4 E \chi). \]

The factor of dipole volume (\( V_j = d^3 \)) was missing in Eq. (55), but its inverse was erroneously present in Eq. (57). They should read

\[ \chi(r') \mathbf{E}(r') = d^3 \sum_{j} h'_{ij} \chi(r) \mathbf{E}(r_j). \]
\[ \mathbf{C}_{ij} = \int_{R^3/V} \, d^3r \, \mathbf{G}(\mathbf{r}_i, \mathbf{r}_j) h(\mathbf{r}_i - \mathbf{r}_j). \]  \hfill (57)

Moreover, the factor of 2 should be removed in the definition of \( q \) after Eq. (56) resulting in
\[ q = \pi / d. \]

The factor of \( V_j \) was missing inside the sum in Eq. (62), and \( \chi \) had a wrong subscript. The correct expression is
\[ \mathbf{A}_i = \mathbf{C}_i + \sum_{j \neq i} \mathbf{C}'(\mathbf{r}_j, \mathbf{r}_i) V_j \mathbf{C}_j^{-1} \mathbf{C}_i. \]  \hfill (62)

The only error that may lead to potential misinterpretation is related to the description of the weighted discretization. The multiplier of \( G \) in the second integral in Eq. (69) should be corrected, leading to
\[ \mathbf{M}_i' \mathbf{X}_i' = \int_{V'} \, d^3r \, (\mathbf{C}(\mathbf{r}_i, \mathbf{r}') - \mathbf{C}'(\mathbf{r}_i, \mathbf{r}')) \chi_i' + \int_{V'} \, d^3r \, (\mathbf{C}(\mathbf{r}_i, \mathbf{r}') \chi_i - \mathbf{C}'(\mathbf{r}_i, \mathbf{r}') \chi_i') \chi_i'. \]  \hfill (69)

This error, together with Eq. (5) above, propagated from a previous publication [2], which has been recently corrected [3]. The latter erratum provides more details and discusses the correct interpretation of the weighted discretization. Fortunately, the reported errata affect no other parts of the review [1].

References