Erratum

On a Formalism to Calculate Single Particle Wave Functions in Crystals Taking into Account Many-Body Aspects

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Eqs. (4.11 c–f), (4.13 a–b) should be replaced by

$$A(z, z') = \sum_{n' \mathbf{k}' j''} f_{n' \mathbf{k}'} F_{\text{ex}}(|\mathbf{k} - \mathbf{k}' + \mathbf{K}_{j''}|) Q_{j''}^*(n \mathbf{k} | z | n' \mathbf{k}') Q_{j''}(n \mathbf{k} | z' | n' \mathbf{k}')$$

(z stands for j or slm), where

$$Q_{j''}(n \mathbf{k} | z | n' \mathbf{k}') = \sum_{j'} v(n' \mathbf{k}' | \mathbf{K}_{j'}) P_{j''}(n \mathbf{k} | z, j' | n' \mathbf{k}') \\ + \sum_{s' l' m'} A(n' \mathbf{k}' | s' l' m') P_{j''}(n \mathbf{k} | z, s' l' m' | n' \mathbf{k}'),$$

$$P_{j''}(n \mathbf{k} | j, j' | n' \mathbf{k}') = \Omega_0 \delta_{j-j', j''}$$

$$- 4\pi \sum_{l=0}^L (2l+1) [P_l((\mathbf{k}' + \mathbf{K}_{j'})^0 \cdot (\mathbf{k}' + \mathbf{K}_j - \mathbf{K}_{j''})^0) \\ \cdot \int_0^{r_0} dr r^2 j_l(|\mathbf{k}' + \mathbf{K}_{j'}| r) j_l(|\mathbf{k}' + \mathbf{K}_j - \mathbf{K}_{j''}| r) \\ + P_l((\mathbf{k} + \mathbf{K}_j)^0 \cdot (\mathbf{k} + \mathbf{K}_{j'} + \mathbf{K}_{j''})^0) \\ \cdot \int_0^{r_0} dr r^2 j_l(|\mathbf{k} + \mathbf{K}_j| r) j_l(|\mathbf{k} + \mathbf{K}_{j'} + \mathbf{K}_{j''}| r)] \\ + 2\pi \sum_{l=0}^L \sum_{m' \substack{l'=0 \\ m'}}^L \sum_{l''=0}^{2L} (2l+1)(2l'+1)(2l''+1) i^{l-l'-l''} \\ \cdot Y_{l, -m}((\mathbf{k}' + \mathbf{K}_{j'})^0) Y_{l', m'}((\mathbf{k} + \mathbf{K}_j)^0) \\ \cdot Y_{l'', m-m'}((\mathbf{k}' - \mathbf{k} - \mathbf{K}_{j''})^0) \int_{-1}^1 P_l^m(z) P_{l'}^{-m'}(z) \\ \cdot P_{l''}^{m'-m}(z) dz \int_0^{r_0} dr r^2 j_l(|\mathbf{k}' + \mathbf{K}_{j'}| r) j_{l'}(|\mathbf{k} + \mathbf{K}_j| r) \\ \cdot j_{l''}(|\mathbf{k}' - \mathbf{k} - \mathbf{K}_{j''}| r),$$

$$\begin{aligned}
P_{j''}(n\mathbf{k}|j,slm|n'\mathbf{k}') &= P_{-j''}^*(n'\mathbf{k}'|slm,j|n\mathbf{k}) \\
&= 4\pi(2l+1)(-1)^m Y_{l,m}((\mathbf{k}' + \mathbf{K}_j - \mathbf{K}_{j''})^0) \\
&\quad \cdot \int_0^{r_0} dr r^2 R(n'\mathbf{k}'|sl|r) j_l(|\mathbf{k}' + \mathbf{K}_j - \mathbf{K}_{j''}|r) \\
&\quad - 2\pi \sum_{l'=0}^L \sum_{l''=0}^{2L} (2l+1)(2l'+1)(2l''+1) i^{l-l'-l''} \\
&\quad \cdot Y_{l',m'}((\mathbf{k} + \mathbf{K}_j)^0) Y_{l'',m-m'}((\mathbf{k}' - \mathbf{k} - \mathbf{K}_{j''})^0) \\
&\quad \cdot \int_{-1}^1 P_l^m(z) P_{l'}^{-m'}(z) P_{l''}^{m'-m}(z) dz \int_0^{r_0} dr r^2 \\
&\quad \cdot R(n'\mathbf{k}'|sl|r) j_{l'}(|\mathbf{k} + \mathbf{K}_j|r) j_{l''}(|\mathbf{k}' - \mathbf{k} - \mathbf{K}_{j''}|r), \\
P_{j''}(n\mathbf{k}|slm,s'l'm'|n'\mathbf{k}') &= 2\pi(2l+1)(2l'+1) \sum_{l''=0}^{2L} (2l''+1) i^{l'-l-l''} \\
&\quad \cdot Y_{l'',m'-m}((\mathbf{k}' - \mathbf{k} - \mathbf{K}_{j''})^0) \int_{-1}^1 P_l^m(z) P_{l'}^{m'}(z) \\
&\quad \cdot P_{l''}^{m'-m'}(z) dz \int_0^{r_0} dr r^2 R(n\mathbf{k}|sl|r) \\
&\quad \cdot R(n'\mathbf{k}'|s'l'|r) j_{l''}(|\mathbf{k}' - \mathbf{k} - \mathbf{K}_{j''}|r).
\end{aligned}$$

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