

Exact solutions to a schematic nuclear quark model and colorless superconductivity

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Corrigendum

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Equation (24), expressing the color symmetric BCS state, should be replaced by

$$|\Phi_{cl}\rangle = \exp \sum_{j=0}^3 \left(K \sum_{0 < m \leq \Omega'} A_{jm}^* + \tilde{K} \sum_{\Omega' < m \leq \Omega} A_{jm} \right) \prod_{j=m}^3 \prod_{\Omega' < m \leq \Omega} c_{jm}^* c_{j\bar{m}}^* |0\rangle,$$

where

$$A_{1m}^* = (c_{2m}^* c_{3\bar{m}}^* + c_{2\bar{m}}^* c_{3m}^*).$$

Equation (25), describing the color symmetric BCS transformation, should be replaced by

$$\begin{aligned} d_{1m} &= \frac{1}{\sqrt{2(1+3K^2)}} (c_{2m} - c_{3m} - K(c_{2\bar{m}}^* + c_{3\bar{m}}^* - 2c_{1\bar{m}}^*)), \\ d_{2m} &= \frac{1}{\sqrt{6(1+3K^2)}} (c_{1m} + c_{3m} - 2c_{2m} + 3K(c_{3\bar{m}}^* - c_{1\bar{m}}^*)), \\ d_{3m} &= \frac{1}{\sqrt{3}} (c_{1m} + c_{2m} + c_{3m}), \\ d_{1\bar{m}} &= \frac{1}{\sqrt{2(1+3K^2)}} (c_{2\bar{m}} - c_{3\bar{m}} - K(c_{2m}^* + c_{3m}^* - 2c_{1m}^*)), \\ d_{2\bar{m}} &= \frac{1}{\sqrt{6(1+3K^2)}} (c_{1\bar{m}} + c_{3\bar{m}} - 2c_{2\bar{m}} + 3K(c_{3m}^* - c_{1m}^*)), \\ d_{3\bar{m}} &= \frac{1}{\sqrt{3}} (c_{1\bar{m}} + c_{2\bar{m}} + c_{3\bar{m}}), \end{aligned}$$

if $0 < m \leq \Omega'$, and should be replaced by

$$\begin{aligned} d_{1m} &= \frac{1}{\sqrt{2(1+3\tilde{K}^2)}} (c_{2m}^* - c_{3m}^* + \tilde{K}(c_{2\bar{m}} + c_{3\bar{m}} - 2c_{1\bar{m}})), \\ d_{2m} &= \frac{1}{\sqrt{6(1+3\tilde{K}^2)}} (c_{1m}^* + c_{3m}^* - 2c_{2m} - 3\tilde{K}(c_{3\bar{m}} - c_{1\bar{m}})), \\ d_{3m} &= \frac{1}{\sqrt{3}} (c_{1m}^* + c_{2m}^* + c_{3m}^*), \\ d_{1\bar{m}} &= \frac{1}{\sqrt{2(1+3\tilde{K}^2)}} (c_{2\bar{m}}^* - c_{3\bar{m}}^* + \tilde{K}(c_{2m} + c_{3m} - 2c_{1m})), \end{aligned}$$

$$d_{2\bar{m}} = \frac{1}{\sqrt{6(1+3\tilde{K}^2)}} (c_{1\bar{m}}^* + c_{3\bar{m}}^* - 2c_{2\bar{m}}^* - 3\tilde{K}(c_{3m} - c_{1m})),$$
$$d_{3\bar{m}} = \frac{1}{\sqrt{3}} (c_{1\bar{m}}^* + c_{2\bar{m}}^* + c_{3\bar{m}}^*),$$

if $\Omega' < m \leq \Omega$.

Equation (29) should be replaced by

$$\mathcal{E}_{\text{BCS}} = \frac{G\mathcal{N}}{9} \left(6\Omega - \mathcal{N} + 1 + \frac{4\mathcal{N}}{3\Omega} \right).$$

For the mathematical development behind these replacements, see a forthcoming note.