

Structure of matrix perturbation coefficients for anharmonic oscillators

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CORRIGENDUM

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It is not true that equation (42) holds for the case $s = 0$ ($m = n$) when $\gamma > 0$. This result does not emerge from the structural analysis.

The correct recurrence relation for this case arises from equation (6), with the odd powers $k = 2h + 1$ replaced by the even powers $k = 2h$. With $m = n$ in (6) we then have the reduced recurrence relation:

$$Q_\gamma^{2h} = (4\mu h)^{-1} \left(2(2h-1) \sum_{i+j=\gamma} E_i Q_j^{2(h-1)} + \alpha(h-1)(2h-1)(2h-3) Q_\gamma^{2(h-2)} \right. \\ \left. - 2 \sum_{t=2}^{\nu} A_t (2h+t-1) Q_{\gamma-1}^{2(h+t-1)} \right) \quad \nu \geq 2 \quad h > 0 \quad \gamma \geq 0$$

which, after an appropriate choice of constants, agrees with the Swenson and Danforth result.

What allows these elements to be defined at $s = 0$ is that the Δ function in (6) with $m = n$ and $k = 2h$ cannot vanish so long as $h > 0$.