

Convergence check

The relation

$$S = (1 + iR)(1 - iR)^{-1}$$

holds for the exact matrices. As N increases this relation is verified for $S(N)$ and $R(N)$.

Also $SS^\dagger = I$, or $S(N)S^\dagger(N) \xrightarrow{N \rightarrow \infty} I$

Occasionally singularities occur. In this case the non-linear parameters can be varied

$$\bar{y}_0(qr) = (1 - e^{-\gamma r}) y_0(qr)$$

$$\phi_k(r) = \sqrt{\frac{\beta^3}{(k+1)(k+2)}} \mathcal{L}_k^{(2)}(\beta r) e^{-\beta r/2}$$