Erratum to: Derivation of tunneling probabilities for arbitrarily graded potential barriers using modified Airy functions

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The authors would like to rectify the incorrect equation, figure, and relevant comments in the above publication.

Erratum I (p. 133)

The tunneling probability is then calculated to be

$$T_{MAF} = \left| \frac{c_7}{c_1} \right|^2 = \left| \frac{j2q_0 \Delta_1 \Delta_2}{\tilde{A}_1 B_T + A_T \tilde{B}_1} \right|^2 \quad (12)$$

Erratum II (p. 134)

As shown in Fig. 3, the MAF method shows fairly low values in the entire range of E , which is, in low-energy range, in agreement with the previous reports by Roy et al. (1993), Kimeu et al. (2008). It is also seen that the MAF results fall to 0 as E/V_0 approaches 1, which is

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Fig. 3 Tunneling probabilities for inverse hyperbolic cosine potential barrier of Fig. 2. (x_0 : midpoint)

presumed to be attributed to the fact that there is a point where $V'(x) = 0$ within the potential profile, a midpoint for this bell-shaped case.

Erratum III (p. 138)

Conclusion

Three types of potential barriers, a bell-shaped barrier, a symmetric exponential barrier, and a truncated exponential barrier, were taken as sample cases to validate the accuracy of the proposed method. It turned out that the MAF method yielded very accurate results for latter two cases, while the method failed for the bell-shaped case. It appeared that the MAF approach is not suitable for graded potential barriers where the potential profile included a point or points where $V'(x) = 0$ within the region of analysis as in Fig. 2.

References

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