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The nodal structure of wave functions with non-local potentials

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The nodes theorem provides a relation between the quantum number of a given bound state and the number of nodes of its wave function. We describe here a family of non-local potentials, with analytical known solutions, whose spectra can be modified at will. For these potentials, there is no relation between the quantum number of a state and its number of nodes. The existence of these potentials suggests that the nodes theorem is not valid when non-local interactions are considered.

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