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Investigation of localized wave function in bilayer phosphorene nanoribbon

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Abstract
In this research, firstly, the structure of a double-layer phosphorene nanoribbon is introduced. Then, for the simplified structure of this system in the presence of a void, the substituted wave function which has a topological origin is analyzed analytically and the analytical results are compared with the numerical method. The Landauer-Buttiker approach is used in the numerical calculation of the substituted probability density (LDOS). Finally, for bilayer phosphorene, by considering more parameters, the wave function and the energy of the substituted state in the presence of a vacancy have been reported numerically.

Keywords: bilayer phosphorene, localized state, vacancy

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