

Vibration of Gamma Graphyne with an Attached Mass

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Abstract : Atomic finite element simulation is applied to investigate the vibration frequency of a single-layer gamma graphyne with an attached mass for the CCCC, SSSS, CFCF, SFSF boundary conditions using the commercial code ANSYS. The fundamental frequencies of the graphyne sheet are compared with the results of the previous study. The results of the comparison are very good in all considered cases. The attached mass causes a shift in the resonant frequency of the graphyne. The frequencies of the single-layer gamma graphyne with an attached mass for different boundary conditions are obtained, and the order based on the boundary condition is CCCC >SSSS > CFCF > SFSF. The highest frequency shift is obtained when the attached mass is located at the center of the graphyne sheet. This is useful for the design of a highly sensitive graphyne-based mass sensor.

Keywords : graphyne, finite element analysis, vibration analysis, frequency shift

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