Analysis of discrete breathers in the mass-in-mass chain in the state of acoustic vacuum

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Abstract: Present study concerns the dynamics of special localized solutions emerging in the mass-in-mass anharmonic oscillatory chain in the state of acoustic vacuum**.** Each outer element of the chain incorporates an additional, purely nonlinear mass attachment. Analytical study of the later, revealed the distinct types of stationary discrete breather solutions. Along with the analytical description of their spatial wave profiles we also establish their zones of existence in the space of system parameters. Stability properties of these solutions are assessed through the linear analysis (Floquet). All analytical models are supported by the numerical simulations of the full model.
Keywords: Acoustic vacuum, Mass-in-mass chain, Breather solutions.

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