



# Slepyan's method for the study of dynamic fracture in metamaterials

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I will start by presenting a powerful method that allows one to treat problems involving the dynamic fracture of discrete structures. Proposed in 1981 by Leonid Slepyan, and originally intended to explain the so-called lattice trapping phenomenon and wave dissipation in lattice structures, it remains probably the only universal and effective analytical tool for tackling a wide range of problems in periodic structures with moving defects/boundaries. The technique naturally leads to Wiener-Hopf (WH) equations and allows for extraction of nontrivial information concerning associated physical responses in the dynamic fracture process even without solving the W-H problems. When applied to the dynamic destruction of metamaterials, it leads to matrix factorization with all adherent difficulties. I discuss both advantages and limitations of the method and conclude by revisiting a few "simplest" scalar problems demonstrating recent advances and highlighting open questions.

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