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Conserved quantity of 2D SH waves in multi-layered media

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We introduce a new conserved quantity alternative to the conventional definition of energy for a layered structure in a 2D SH problem. The quantity is defined by the average of power of a half transfer function multiplied by the impedance, and the conservation across the material interface is analytically proved for a two-layered case. For three-, four-, and ten-layered cases, the conservation is examined by applying the Monte Carlo simulation method, and then the quantity is supposed to be conserved through the layers from an engineering viewpoint.

Keywords: conserved quantity, multi-layered structure, wave propagation