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**Some results on the energy transmission through an elastic half-space loaded by a periodic distribution of vibrating punches.** (English) Zbl 1293.74239

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Summary: We develop an analytical approach to study the wave process arising in an elastic half-space because of harmonic vibrations applied on its free surface by a (periodic) distribution of rigid *punches*. By assuming perfect coupling between punches and half-space, the (*in-plane*) propagation problem is firstly reduced to a  $2 \times 2$  system of integral equations for the contact stresses. Then, in the frequency range implying the so-called *one-mode* (far-field) propagation, suitable mild approximations on the kernels lead to some related *auxiliary* systems of integral equations, which are independent on frequency and can be solved analytically. The explicit formulas thus obtained are reflected through some figures and enable us to discuss the energetic properties of the wave process with respect to frequency. A direct numerical treatment of the original system of (exact) integral equations confirms the precision of the analytical solution.

**MSC:**

74J10 Bulk waves in solid mechanics

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**Keywords:**

vibrating punches; energetic properties of wave propagation; analytical results

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