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Influence of Acoustic Waves on Stability of Sliding Between Two Elastic Solids

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Steadily sliding between two contacting elastic half-spaces with Coulomb friction under the action of incident harmonic body waves is studied. Partial stick and separation of the interface is considered. Fourier analysis technique and an iterative method are used to solve the mixed non-linear boundary value problem. Influences of the incident wave on the steady sliding between two solids are discussed in details, Some questions, which may be of interest to scientists working in the fields of friction, earthquake, etc., are answered: What is the condition for the appearance of the stick zones? Can the two solids slide with the original sliding speed under the action of the incident acoustic waves, especially when the partial stick appears? If not, how can the solids be kept sliding with the original speed? Under what condition does the local separation of the interface take place? And how does the separation affect the sliding?

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