

Surface Waves on an Impermeable Boundary of a Poroelastic Medium

Bettina Albers

Weierstrass Institute for Applied Analysis and Stochastics, Berlin, Germany

The dispersion relation for surface waves on an impermeable boundary of a fully saturated poroelastic medium is investigated numerically in the whole range of frequencies. To this aim a linear simplified model of a two-component poroelastic medium is used. Similarly to the classical Biot's model, it is a continuum mechanical model but it is much simpler due to the lack of coupling of stresses. In the whole range of frequencies there exist two modes of surface waves corresponding to the classical Rayleigh and Stoneley waves. The numerical results for velocities and attenuations of these waves are shown for different values of the bulk permeability coefficient in different ranges of frequencies. In particular, we expose the low and high frequency limits, demonstrate the existence of the Stoneley wave in the whole range of frequencies as well as the leaky character of the Rayleigh wave.

[View the extended summary](#)