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Surface Waves in Fluid Saturated Porous-Elastic Half Space.

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The surface waves in fluid saturated porous-elastic half space with free boundary are studied on the basis of Bio's theory. Two types of boundary conditions are considered. One of them is the pervious surface and another one is the impervious surface.

There is the surface wave in fluid saturated porous-elastic half space with free boundary without regard for dissipation. If the speed of shear wave is the lowest, the surface wave is formed by three non-uniform waves. The speed of this surface wave can be obtained on the basis of the model of equivalent single-phase medium with the accuracy to 10% both for pervious surface and for impervious surfaces.

If the speed of dilatation wave of second kind is the lowest, there is the pseudo-surface wave formed be two non-uniform waves (shear wave and dilatation wave of first kind) and propagating dilatation wave of second kind. The dilatation wave of the second kind remains as the propagating wave and it transports energy in depth.

Wave pattern is essentially changed if the attenuation due to by the movement of viscous fluid in porous medium is taken into account. There is single surface wave attenuating along direction of propagation for pervious surface. Its phase speed is increased a little with growth of frequency and tends to the speed of surface wave in equivalent single-phase medium.

There are two surface waves in the case of impervious surface. The first wave propagates with the phase speed close to the speed of surface wave in half space with pervious surface. The speed of the second wave tends to the speed of dilatation wave of the second kind in the high frequency limit. Attenuations of two surface waves in porous-elastic half space with impervious surface is essentially differ. The first wave

attenuates weakly but the attenuation of the second wave is high.