Article Abstract

Title:	Effects of crack-dilatancy on rayleigh waves in fluid-saturated porous media
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Abstract:	The study considers the propagation of surface waves on the stress-free surface of a porous solid saturated with non-viscous fluid. The surface pores have the option of being either sealed or fully-opened. With the presence of dilatant cracks, the interior of the porous solid is characterised through three different crack-regimes, based on the connections between embedded cracks. Secular equations are derived in closed form for the propagation of Rayleigh waves in the porous media with sealed or fully-opened surface pores. The velocity of non-dispersive surface waves varies significantly with the density of cracks present. However, aspect (thickness to radius) ratio of (circular) cracks may not have much effect on the velocity of Rayleigh waves. The opening of surface pores may be an important reason for a faster propagation of Rayleigh waves in any realistic elastic medium. Finally, the dilatancy due to the growth of cracks up to their interconnection or drainage may be able to affect the velocity of Rayleigh waves quite significantly.
Keywords:	Rayleigh waves, phase velocity, dilatancy, porous solid, cracks.