

# **The Effect of Soil Locking on the Shock Wave's Attenuation**

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## **ABSTRACT**

The paper investigates the characteristics of propagating shock waves in soil, resulting from an explosion of a spherical or cylindrical charges. The soil is modeled as a bulk irreversible compressible elastic plastic medium, including full bulk locking and dependence of the current deviatoric yield stress on the pressure. The dependence of the peak stress attenuation, during the shock wave propagation, on the full locking parameter of the equation of state was studied. When the pressure-volumetric strain relationship beyond the point of full compaction is not steep, the attenuation may be described by a power law that may be expressed as a linear relationship on a logarithmic scale. When this relationship is relatively steep however, the logarithmic dependence of the peak stress on the shock wave coordinate is close to a bi-linear function. It was also shown that the shock wave peak stress parameters of this power law for the high pressure range (i.e. short distance of the wave front from the explosive charge) are about linearly dependent on the full locking parameter.