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**Deducing ground structure using seismic pulses originating from
an outdoor explosive source**

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Near-surface layering of ground soil can influence propagation of acoustic and seismic pulses originating from above-surface sources. Simultaneous recording of acoustic air pressure and seismic radial and vertical particle velocities resulting from a small, above ground explosion is used to obtain information about soil structure near the surface. Assuming non-linear effects to be small at the ranges of interest here, a numerical model called Fast Field Program for Layered Air Ground Systems (FFLAGS), developed originally for continuous sound sources above a porous elastic ground is used to model a porous elastic layered ground system. Suitable optimisation methods were used to predict a set of best fit parameters for the near-surface ground structure. It is shown that the model can explain multiple seismic arrivals and give a reasonable prediction of wave speeds and layer depths while the pressure pulse can predict permeability of the surface soil.