RADIATION PATTERNS OF BURIED MULTIPOLAR SOURCES IN A FLAT STRATIFIED EARTH

L. S. Turnbull, Jr.

Expressions are derived for the far displacement field of Rayleigh and Love waves from multipolar sources using the approach of Ben-Menahem and Harkrider. The medium transfer functions for dipolar sources from a Gutenberg flat continental earth are generated, and these are used to obtain radiation patterns for quadrapolar, octapolar, and sexdecipolar type sources at various depths from 10 to 100 sec period. The practicability of detection of multipolar source effects is examined, with a minimum azimuthal sampling interval determined as a function of period, source parameters, and mode.

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THEORETICAL ACOUSTIC GRAVITY WAVES AND RAYLEIGH WAVES GENERATED BY UNDERGROUND EXPLOSIONS

D. G. Harkrider

Theoretical barograms have been calculated for acoustic-gravity waves generated by underground explosions. Two formulations were used. 1) The thermally modeled gravitating atmosphere is excited by a time varying deformation of the earth's surface. The final deformation is the static surface displacement due to a point pressure source at depth in an elastic half-space. 2) The same atmosphere overlying a multilayered half-space is excited by a point pressure source at depth in the solid medium.

A comparison of the long period acoustic-gravity waves for these two source models will show whether they are primarily generated by the propagating seismic surface displacements or the final static deformation. The answer to this should also apply to acoustic gravity waves generated by earthquakes.

Theoretical Rayleigh waves are calculated for the second model and numerical relations for surface wave magnitudes and acoustic-gravity wave amplitudes as a function of seismic energy and source depth of explosions will be presented.

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RAYLEIGH WAVE GENERATION BY ATMOSPHERIC EXPLOSIONS - COMPARISON OF THEORETICAL MODELS

C. A. Newton and D. G. Harkrider

Theoretical seismograms are calculated at a teleseismic distance from atmospheric sources over oceanic and continental models. Wave forms are compared for two methods of applying an atmospheric explosion to Rayleigh wave generation. One method uses Glasstone scaling of a point energy source in a thermally stratified gravitating atmosphere coupled to a multilayered solid elastic half-space. The other method uses modified Sachs scaling in a spherically symmetric exponential atmosphere to calculate the