

Focus zone model and depth determination based on amplitudes of *pP* phases

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GS RAS, Obninsk, Russia

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Abstract Analysis of difficulties connected with determination of crust tectonics seismic events is defined by rupture process. Detailed analysis showed that a set of first arrivals associated with an event contains arrivals generated on different depths. This indicates the existence of several instrumentally defined cofoci in the focus zone. Consequently, the location algorithm should pick up several more significant by amplitude of first arrivals. Then, seismic event depth will define that one rising maximal seismic signal. Investigation shows – first arrivals may be projected into one point on seismic record even if they are generated at different depths. Thus, one impulse of first arrival may correspond to several depths. Hence appears the principal difficulties to determine depth solely using P phases. Solution of the problem is automated determination of time arrivals of depth phases *pP*. The last should be generated at a certain depth. The event depth is chosen by maximum value depth phase amplitude. Algorithm uses all records during the calculation process at the same time. Moreover it was revealed that local second events after first arrival have been registered. Second events may have time delays restricted by seconds. Second event impulse amplitude may be more than impulse amplitude of really first arrival at given depth. On the whole, a group of local first arrivals are in the frame of the period of base event impulse.

Keywords Seismic event, the ripping line, focal zone, depth detection.

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Information about authors

Epifansky Alexey Grigorievich, PhD, Leading Engineer of the Geophysical Survey of the Russian Academy of Sciences (GS RAS), Obninsk, Russia. E-mail: epifansky@gmail.com

Dulentsova Ludmila Grigorievna, Junior Researcher of the GS RAS, Obninsk, Russia. E-mail: DylencovaL@gstras.ru