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Study on epicenter accuracy based on velocity models acquired from joint inversion

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Seismic location is a crucial problem in event monitoring and the research on improved location accuracy has been driven by efforts to effectively monitor the CTBT. Epicenter location accuracy is affected by many factors, including picking quality of seismic arrival times, accuracy of velocity model and distribution of seismic network. The accuracy of the velocity model will greatly influence the location results when the phase picking error and the geometry of the seismic networks are fixed. With the recent development in seismic imaging methods and accumulation of seismic observed data, a variety of velocity models have been constructed. While some studies focus on analyzing the consistency and reliability of obtained velocity models, few research pay attention to the location accuracy based on different velocity models. To develop more accurate velocity models and systematically assess the location accuracy improvement using different models, we collected seismic datasets from southwest China and conducted joint inversion using body wave arrival times, surface wave dispersion and receiver functions. A comprehensive evaluation has been performed to compare the location accuracy between the collected velocity models and the newly developed model. The results can provide insights for the application of three-dimensional velocity models in seismic monitoring.

E-mail

han.shoucheng@ndc.org.cn

Primary author: Dr HAN, Shoucheng (CTBT Beijing National Data Center)

Co-authors: ZHEHAN, Liu (CTBT Beijing National Data Center); Mr WEI, Tang (CTBT Beijing National Data Center); XIAOMING, Wang; JIE, Shang

Presenter: Dr HAN, Shoucheng (CTBT Beijing National Data Center)

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