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improved velocity model for routine hypocenter location in Central Brazil

Brazil is located in the stable continental interior of South American plate. The seismicity distribution is not uniform and in general it is characterized by low seismicity (M<3.5). In the last century occurred only two dozen events of magnitudes above 5, two of which with magnitudes larger than 6. The Brazilian Seismic Catalog was initially compiled by Berrocal et al. (1984) and it is maintained by a pool of institutions SIS-UnB, IAG-USP, UFRN, CPRM and ON. The catalog is very heterogeneous and the location quality for some events is unknown. A better and more uniform monitoring started after the establishment of the Brazilian Seismograph Network, after 2014, the detection threshold in the Amazon region dropped from M4.5 to M3.5. In this study, we propose a new 1D velocity model for the central Brazil. From the catalog, we have selected 77 well-locable events with a total of 812-P wave observations from 57 stations. A series of coupled hypocenter-velocity-model non-linear inversions were performed with the code VELEST searching the model space for best performing results. While, previously the seismicity exclusively was located at very shallow depth, with the new model we do find evidence for some hypocenters located down to 20km depth.

Primary author: DE CARVALHO, Juraci Mario (Seismological Observatory)

Presenter: DE CARVALHO, Juraci Mario (Seismological Observatory)

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