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Brazil's seismicity

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Sismicidade do Brasil

Introduction

Although Brazil is located within the interior of the South American Plate, it has a notable historical record of seismic activity, including both natural seismicity and reservoir-induced seismicity. Since 1984, the Brazilian scientific community has been documenting and investigating these phenomena, particularly in response to the growing construction of hydroelectric power plants. The analysis and updating of such information are essential for understanding the continental lithosphere and tectonic processes in intraplate regions.

Method and/or Theory

This study applies methodologies developed by the Seismological Observatory of the University of Brasília (UnB), involving data analysis from the Brazilian Seismographic Network (RSB), seismic bulletins, and technical literature on reservoir-triggered seismicity. Software such as SeisComP, ArcGIS, SAC, SESAN, and Oasis Montaj are used to determine source parameters (magnitude, epicenter, hypocenter, focal mechanism), model the crust, and correlate data with geological structures. Maps of both natural and induced seismicity will be generated, integrating seismological data with Brazil's structural geology.

Results and Conclusions

The study aims to update and systematize the historical record of seismicity in Brazil through the development of two main products: (1) a seismicity map of Brazil highlighting recorded natural events and (2) a map showing induced earthquakes across Brazilian territory. The research is expected to enhance the geophysical characterization of areas susceptible to seismic activity, providing valuable input for monitoring, risk prevention, and a better understanding of the geodynamic processes acting within Brazilian territory.