

EGU24-8255, updated on 03 Nov 2024

<https://doi.org/10.5194/egusphere-egu24-8255>

EGU General Assembly 2024

© Author(s) 2024. This work is distributed under the Creative Commons Attribution 4.0 License.



The Castanhão EPISODE - the case study of Reservoir Induced Seismicity (RIS) in NE Brazil.

Helena Ciechowska¹, Łukasz Rudziński¹, Beata Orlecka-Sikora¹, Alessandro Vuan², Anastasios Kostoglou¹, and Aderson Farias do Nascimento³

¹Institute of Geophysics Polish Academy of Sciences, Warsaw, Poland (office@igf.edu.pl)

²National Institute of Oceanography and Applied Geophysics, Trieste, Italy (ogs@pec.it)

³Universidade Federal do Rio Grande do Norte, Brazil (aderson.nascimento@ufrn.br)

The man-made alteration to the environment can become a source of seismic activity. The Castanhão region (Ceará, NE Brazil) can pose as an example of such. The Castanhão Reservoir was created as a result of dam construction over the Jaguaribe River, which triggered the occurrence of earthquake swarms on the site.

In the following study, we aim to analyze the data and understand the seismic mechanism behind the seismic activity in the Castanhão region. Such study required an interdisciplinary approach employing data from various disciplines such as seismology, geology, geomechanics, and hydrology. The starting data set contains continuous waveforms recorded on 6 seismological stations from January to December 2010. The two detection algorithms were applied for earthquake detection. Initial detection was performed with the use of the STA/LTA algorithm, which allowed for the preparation of 53 templates with a good S/N ratio. Further, in the frequency range from 5 to 100 Hz, the input templates were used to match self-similar events to augment the initial catalog.

Due to the station coverage and low magnitude of the events, the detailed analysis of the quakes is performed on 187 events out of over 300 that were detected during PyMPA template matching. The localization was performed using Hypo71 software and analysis of mechanisms is done with the KiwiTool.

The Castanhão EPISODE is planned to be made available on the EPISODES Platform of EPOS Thematic Core Services Anthropogenic Hazards.