

Deep Refraction Experiment in the Central Portion of the Tocantins Province, State of Goiás, Central Brazil

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The deep refraction experiment in Goiás belongs to a major geophysical and geological project being supported by FAPESP to study the crustal structure of the Tocantins Province in Central Brazil. It is a pioneer interdisciplinary and interinstitutional project in Brazil, such as it is the deep refraction experiment with the characteristics used in this project.

The Tocantins Province was build up during the Brazilian orogenic cycle. It represents the inversion of an oceanic basin with a passive margin, enclosed between the São Francisco and Amazon cratons. Due to its large dimension and terrain diversity, this province may represent the most complete orogenic reminiscent in South America. It is formed, in the eastern side, by metasediments of the Brasília fold-belt and by the Araguaia fold-belt, in the western side, enclosing a complex terrain, the former Goiás massive, with continental and island arc characteristics.

Two refraction lines with directions E-W and NW-SE, that cut the main geological units and structures of the Tocantins Province, were performed in September 1998. Each line was 300 km long with 120 recording points. Seven sources were located at every 50 km along each line, using 500 to 1000 kg of IBEMUX emulsion explosives (5 km/s), accommodated in 45-65m deep bore-holes. We used 110 seismographs borrowed from the PASSCAL program completed with IAG/USP equipment.

In this work we intend to present a preliminary velocity model for the Tocantins Province, defining the main crustal discontinuities and delineating, in subsurface, the known geological unconformities.