

STRUCTURAL MODELING OF BOM JARDIM GROUP RHYTHMITES IN THE BELA GRES QUARRY, CAMAQUÃ BASIN

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ABSTRACT: The Bom Jardim Group is preserved within the Sul-Riograndense Shield and registers several tectonic deformational events since its deposition in the Ediacaran period. Bom Jardim Group is comprised of the Cerro da Angélica, Hilário and Picada das Graças formations. Cerro da Angélica Formation is exposed in the Bela Gres quarry. The quarry has 220x350 m, totaling 64,000 m² area and it is oriented to NW–SE directions. The Cerro da Angélica Formation in the Bela Gres quarry is composed of thin beds of massive to stratified sandstones, massive and laminated mudstones and rare intraformational conglomerates and breccias. Sequences are folded and faulted, and the goal of this work is to present a structural modeling project using both explicit and implicit strategies to unravel the deformational history of the studied section. Folded beds and fractures geometries were modeled by the digitalization of structural intersection lines in a high-resolution virtual outcrop model, coupled with field structural analysis using high-resolution orthophoto mosaics. The 3D intersection lines and orientation vectors of structures measured in the field were the primary information used in the construction of the structural models. In the explicit method, intersection lines and orientation vectors were used to create 3D surfaces by projecting lines according to each orientation by best fit/beta vector analysis. The implicit method is based on the interpolation of a potential-field. The classic potential-field method consists in interpolating a scalar function that indicates to which side of a geological boundary a given point belongs to, based on cokriging of point data and structural orientations (foliation, bedding, faults). Results shows that deformation in the analyzed sectors of the Bela Gres quarry occurred by an oblique counterclockwise compression, generating folds by flexural slip and fault propagation fold mechanisms. Deformation preserved in the Bom Jardim Group rhythmites in the Bela Gres quarry is associated to reactivations of structures related to the Caçapava do Sul Magnetic Anomaly. This ca. 250 km magnetic lineament is interpreted as a suture zone between the São Gabriel Arch and the Tijucas Domain of the Sul-Riograndense Shield. Such reactivations can be associated to an NS compression generating a counterclockwise rotation of structures and NS extensional fractures.

KEY-WORDS: STRUCTURAL MODELING; RHYTHMITES; SUL-RIOGRANDENSE SHIELD.