

THE GEOLOGY OF SOUTH ATLANTIC ISLANDS AND ITS CORRELATION WITH THE SAMA

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ABSTRACT: The main objective of this study is to establish a correlation of the geology of the islands located in South Atlantic and the South Atlantic Magnetic Anomaly (SAMA) using geomagnetic data collected from seven geomagnetic stations at low and medium latitudes. Measured values of the horizontal (H), declination (D) and vertical (Z) components of the Earth's magnetic field were used. The chosen islands were selected considering their position relative to the center of SAMA, which is the biggest anomaly in a global scale. One of them is near to its central region, the second one, in medium latitude, between South America and Africa and finally, the third one in low latitude. Four continental stations were considered. Two of them near to the center of the anomaly, one in the northeastern border and the last one, also in medium latitude, however in the African continent. In the dynamics of the interaction of solar wind and the geomagnetic field, the consequences are directly verified in the SAMA influence region, in special for the D and Z components. The first of them is directly related to the atmospheric phenomena and the second with the magnetic susceptibility of the rocks. Therefore, the magnetic registers for the islands of Ascension Island (ASC), Port Stanley (PST) and Tristan da Cunha (TDC) were considered. The continental references were Hermanus (HER) in South Africa, Pilar (PIL) and Trelew (TRW) in Argentine and Vassouras (VSS) in Brazil. The magnetic data of the stations were collected with sample rate of one minute, in accordance with the data format IAGA2002, being observed in analytic and graphic ways to determine the intensities, variations, correlations and other aspects with the objective to evaluate the influence of the respective local geologies in the Z component, considering SAMA position in the period and it's distance to the geomagnetic observatories in which the data were used. The same baseline, methods of data treatment and graphics generation were used. Plus, the majority of cyclic variations and measurements errors were removed. Both geomagnetic calm and disturbed days were evaluated for a better analysis of the solar quiet (Sq) and solar disturbed (Sd) periods in order to assist the evaluation of the internal and external field relevancy on the Z component.

KEY WORDS: SAMA, GEOMAGNETIC FIELD, MAGNETIC ANOMALY.