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A potential field study on Bransfield Strait [Western Antarctica] by the use of a Poisson theorem's based technique

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The Poisson's theorem establishes a linear relationship between the magnetic and gravity potential, if three conditions are valid: (1) the sources generating the magnetic and gravity potentials must be the same; (2) the magnetization direction must be uniform within the sources; and (3) the Magnetization-density ratio (MDR) must be constant within the sources (Blakely, 1995). The Poisson's theorem has been used in the past to calculate single-source magnetization-density ratios and direction of source magnetization. Usually three parameters were obtained: correlation coefficient, slope and intercept. Which help to described the internal correlation existing between gravity and magnetic anomalies and which may yield information regarding anomaly source properties. Mendonça (2004) proposed a simple analytical technique where both MDR and magnetization direction (MI) could be derived in a one-pass automatic way (non iterative) from a pair of gravity and magnetic profiles in those regions where Poisson conditions are satisfied. This method introduces an objective tool to analyse the area of the Bransfield Basin [Western Antarctica] from the point of view of its magnetisation and density. We have taken advantage of the gravity and magnetic grid obtained after processing the satellite data (gravity) and the historical magnetic data set. As the method requires very elongated anomalies, we have selected a proper profiles orientation from a previous analysis of the maps of the corresponding gravity and magnetic anomalies. In this communication we will show our results, discussed them, as well as point out our next aims on this subject.