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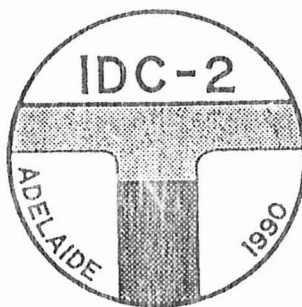
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ABSTRACTS

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MAFIC DYKES AND EMPLACEMENT MECHANISMS



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ON THE MAGNETIC DETECTABILITY OF MESOZOIC PONTA GROSSA ARCH DYKE SWARM: AN INTEGRATED GROUND/AIRBORNE MAGNETOMETRY AND ROCK MAGNETISM STUDY

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Mesozoic Ponta Grossa Arch Dyke Swarms occur between the eastern border of the Parana basin and the southeastern Brazilian continental margin. It comprises of hundreds of 20 to 50 meters thick tholeiitic basalt dykes which intrude the Precambrian basement and Paleozoic sediments along the NW-SE direction. Preliminary analysis of aeromagnetic data suggested that these dykes may extend northwesterly towards the center of the Parana basin, under basaltic flows and post-volcanic sediments.

In order to investigate the detectability of these non-exposed dykes by airborne magnetometry, a combined study of ground magnetic survey and dyke magnetism was carried out in one region (Guapiara Lineament) where dykes are exposed. A total component magnetic profile of 12 km was set up with an average space of 12.5 to 25 meters between readings. There is a clear correspondence between exposed dykes and short-wavelength magnetic anomalies. Many unexposed dykes were also detected from observed magnetic anomalies and an average frequency of 2 dykes per kilometer has been determined for this region. The ground magnetic data was upward-continued to coincide with the altitude of one line of the aeromagnetic survey flown at 450 meters above ground level (a.g.l.). This process revealed that most of dyke magnetic anomalies are highly attenuated at altitude as low as 100 meters a.g.l.. At 450 meters, only anomalies associated with a group of closed spaced dykes or high amplitude (above 4000 nT on the ground) magnetic anomaly of a single dyke remain. These results were integrated with data of magnetic susceptibility and natural remanent magnetization of dyke samples in order to establish a quantitative criteria of dykes detectability by conventional airborne magnetometry. For this particular region, it is found that most of the dykes can only be detected by ground magnetic survey due to low magnetization and small thickness of the dykes.