

INTEGRATION OF RADARSAT STANDARD, LANDSAT TM AND AIRBORNE GAMMA RAY DIGITAL DATA FOR GEOLOGICAL MAPPING IN THE ALTA FLORESTA REGION (BRAZIL)

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This research focussed on a geological mapping undertaken in the Alta Floresta Region, center-western part of the Amazon Region (Mato Grosso State), based on digital integration of RADARSAT Standard (S1, S3, Landsat TM and airborne gamma ray data. The area is characterized by a flat terrain, with intense anthropogenic activities, poor geological knowledge and a high potential in terms of gold mineralization. The remote sensing images were orthorectified and integrated through decorrelation plus IHS transforms. Airborne gamma ray data (Total Count, Uranium, Thorium, Potassium and ratios) were integrated with optical and SAR data through pseudo-color tables and IHS transform. A performance's evaluation was carried out taking into account the contribution of each the integrated product for geological mapping. Seven lithostructural domains were characterized: the basement, a volcano-sedimentary sequence, basic rocks, granitoids, acid extrusives, anorogenic granites and a metasedimentary cover, with ages ranging from Archean up to Meso Proterozoic. In addition, remarkable N60-70W trending strike-slip (ductile and ductile-brittle shear zones) systems were also characterized through visual interpretations of the integrated products and field verifications. The investigation has shown the importance of the digital integration of orbital remote sensing and airborne geophysical data for geological mapping and has provided new insights regarding the controls for the primary gold mineralization in the area.