

INTEGRATION OF HIGH-RESOLUTION GEOPHYSICAL DATA AND DIGITAL ELEVATION MODEL ON GOLD EXPLORATION IN THE CENTRAL PORTION OF QUADRILÁTERO FERRÍFERO, MINAS GERAIS, BRAZIL

1,2ROLIM, S.B.A. and 2AMARAL, G. 1IG/UFRGS, Porto Alegre, RS; 2IG/Unicamp, Campinas, SP.

Here, we present results from the integration of high-resolution airborne geophysical data and digital elevation model (DEM) as an approach to understand the definition of the gold mineralisation controls on the central portion of the Rio das Velhas Greenstone Belt (RVGB), Minas Gerais. The main gold occurrences are found in metasediments and metavolcanics of the Nova Lima Group, (the basal unit of Rio das Velhas Supergroup) associated to the São Vicente Shear Zone. The orebodies are generally composed of sulfide and quartz veins enveloped by hydrothermal alteration zones. The raw geophysical data were converted into 60m grids (kriging interpolation) and enhanced by a group of linear and non-linear filtering. The results were interpreted and displayed as images, contours and profiles. DEM was combined with geophysical data for better visualize the distribution and concentration of radioelements as well as the structural patterns and lithological units of the area. The datasets were integrated using the techniques of digital image processing and geographic information systems, thus providing a dynamic link of all information. Airborne gamma-ray spectrometric, magnetic and eletromagnetic (apparent resistivity) data, when combined with DEM (elevation, slope and aspect data), showed to be complementary as a definition of lithological boundaries (magnetic and non-magnetic), hydrothermal alteration zones and geological structures (intersecting magnetic trends, conductive and non-conductive systems). This synergy is a potencial tool for mineral exploration in Archaean terrains.