Abstract

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Title 3D data integration for modeling in the Portuguese sector of the Iberian Pyrite Belt (IPB)

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Abstract

In order to build a tridimensional model including the identification of existing and potential new mineralised areas, within a selected area of the Iberian Pyrite Belt (~ 100km x 25km) - regional scale approach - it was necessary to gather and integrate all the available data, namely: geological maps, ratio-scale data from geophysical surveys (seismic, gravimetrics, radiometrics and magnetics), drill holes, digital terrain model, etc. Each dataset was obtained through distinct methods and resolution scales. Moreover, there are places with scarce or no data at all.

The drill hole logs were represented with a lithological classification for 3 main formations: Mértola, Volcanic-Sedimentary and Phyllite-Quartzite. Based on this dataset and classification, two initial surfaces were created defining the upper and lower boundary of the VS formation. In some areas with scarce information, it was used seismic stacks to define faults and lithological transition surfaces. Also, faults represented in 2D were converted into 3D by defining their depth, inclination and azimuth.

This study shows that integration of data with different resolution scales and sources may be used to model lithological structures in a 3D space. The results are crossed with geophysics and geology to be validated and complemented.

Since the spatial modeling functions used are sensitive to data availability, the accuracy of the modeling can be randomly biased if the initial data (hard data) is not representative of the mineralized region. Therefore the exploration model of this study is being adapted in order to allow an approach based in multiple-point statistics.

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