

## **POLYNOMIAL AND HARMONIC REPRESENTATIONS OF REGIONAL HEAT FLOW FIELDS IN THE SOUTH AMERICAN CONTINENT**

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The geothermal data base for South America has recently been updated incorporating results of new heat flow measurements in the western (Bolivia and Chile) and eastern (Brazil) parts of the continent. This data base has been found to be useful in investigating regional trends of heat flow in the central parts of South America, even though the geographic distribution is highly non-uniform over large areas in the southern and northeastern parts. As a first step, polynomial methods were employed in generating maps of regional heat flow. The technique adopted is based on a general purpose least squares solution to determine the coefficients of the fourth order polynomial in latitude and longitude that provide best fit to the observational data set. The results obtained indicate low to normal values of regional heat flow (in the range of 40 to 70 mW/m<sup>2</sup>) in the Brazilian platform and in the central Andes and higher than normal values (> 70 mW/m<sup>2</sup>) in the Patagonian platform and in the southern Andes. The regional trends also reveal isolated pockets of higher than normal heat flow in some parts on the eastern continental margin. However, problems arising from low data density allow only limited insights into the nature of heat flow variations along and across the Andean region. Thus trends associated with changing tectonic patterns and subduction related magmatism cannot easily be identified in polynomial representations of the regional heat flow field. Comparison with manually contoured maps reveal that usefulness of polynomial and harmonic representations of regional thermal fields can be improved by incorporating empirical estimators of heat flow for peripheral areas, especially in cases where data quality is highly variable.