

A model for thermal gradient and heat flow in central Chile: The role of thermal properties

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The aim of this work is to quantify variations in heat flow and thermal gradient patterns at the latitude of central Chile and to evaluate the role of thermal properties of macro-geological units within the lithosphere. We developed a numerical thermal model for a continental-scale cross section at 33 ° S latitude, integrating available and new data on geometry and dynamics of subduction, as well as thermal and mechanical properties for the continental and oceanic lithosphere, and asthenosphere. The model compares heat flow and thermal gradient curves against homogeneous inputs for radiogenic heat production (RHP) and thermal conductivity. The results of this model were calibrated with results of thermal gradient measurements at different morpho-tectonic domains. The results show that both, cold slab subduction and mantle wedge advection, play major roles in the regional thermal structure. Variations with respect to regional tendency are due to changes in thermal pr