MANTLE WEDGE FLOW AND THERMAL MODELS FOR THE CENTRAL MEXICAN SUBDUCTION ZONE

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In the last years, the models of the mantle wedge flow in the subduction zones, including the thermal models are applied in order to explain the source of the arc volcanism. In this study the flow in the mantle wedge is modeled using Navier-Stokes equations for an incompressible fluid with isoviscosity and creep diffusion law for olivine. Then the corresponding thermal models were developed for the Central Mexico subduction zone. Both thermal models, one for the isoviscosity and another for the creep-diffusion law for olivine, suggest that the subducting plate beneath the volcanic arc scarcely reach the melting conditions. Strong temperature gradients are observed in the model with the creep-diffusion viscosity, suggesting that the mantle beneath the volcanic arc is melted, being a source of the volcanism in the area. The model reveals also the conditions for the serpentine (and associated minerals) stability in the tip of the wedge. The location of the serpentine in the wedge may indicate a down dip limit of the intraplate earthquakes.