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Background fluid flow in deep sediments solely driven by natural heat – Case study of the location Allermöhe (Germany)

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Free stratabound Rayleigh convection has been shown to be first order dependent on the geometry of the geological structure by Kühn and Günther (2007). Within their models they studied stratabound Rayleigh convection as a means of transport for leaching of solutes from salt diapirs. The 3D model of Allermöhe has been obtained by digitizing and attributing georeferenced lithological and structural contour lines of major stratigraphic units from the "Tectonic Atlas of Northwest Germany" (Baldschuhn et al. 2001).

Here we enlarged the model to the scale of 20 km by 30 km covering a depth of 5000 m from the surface to the bottom of the model to study the influence of salt structures on heat transfer processes and resulting fluid flow pattern.

It is shown that the influence of salt diapirs within the structure is of minor importance compared to the existence of underlying Zechstein salt with regard to developing stratabound Rayleigh convection. However, the topology of the Zechstein unit has less effect as well. Major impact imposed on the fluid flow pattern is due to areas salt has left from in the vicinity to still existing Zechstein units.

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