MODELING THE THERMAL FIELD OF THENE-GERMAN BASIN - THE ROLE OF ROCKPROPERTIES AND CRUSTAL DATA ON MODELING

Ondrak, R. and Scheck, M. GeoForschungsZentrum, Potsdam, Germany

Modeling of thermal field of sedimentarybasins can be an important tool forprediction and interoperation oftemperature underground. The mostimportant parameters affecting theresults of thermal modeling aredistribution and magnitude of physicalrock properties, in particular thermalconductivity and radiogenic heatproduction, and heat flow from theunderlying crust. To evaluate theimportance of the parameters and testingvarious boundary conditions, the3d-conductive thermal field iscalculated using a 3D-FEM model. Adigital structural model of the NE-German basin focusing on the post-Carboniferous sedimentary basin fillprovides the framework for thecalculation of the conductive thermalfield. The model covers an area of330x230 km with a 4x4 km spatialresolution being sufficient to resolveimportant geological features, e. g.large salt diapirs. Simulation resultsare compared with temperature data fromvarious wells of the basin. Resultsshow, that the temperature distributionin the basin's sedimentary fill ismainly controlled by the distribution ofthermal conductivities. The up toseveral kilometer thick Zechstein saltswith their high conductivity have alarge influnce on the thermal field ofthe NE-German basin. Also of greatimportance are variations of thermalconductivities because of facies changeswhich explain regional modifications oftemperature distribution. In addition,structure and radiogenic heat productionof the crystalline crust shows asignificant effect on the thermal fieldof the basin.