



## **A 3D Model of the Wathlingen Salt Dome in the Northwest German Basin from joint modeling of Gravity, Gravity Gradient, and Curvature**

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In the last few decades, numerous attempts have been made on modeling of salt tectonics and several models were developed to explain the ascent of salt diapirs modeling different geophysical parameters like density, magnetic susceptibility, seismic velocity etc. We have obtained a 3D model of salt diapirs in the southern part of Northwest German Basin from joint modeling of historical torsion balance measurements which were reprocessed. Gravity, gravity gradients ( $W_{zx}$ ,  $W_{zy}$ ) and curvature derived from horizontal gravity gradients,  $W_{xy}$ , and Horizontal Directive Tendency (HDT) are jointly modeled to decipher geometrical structure of the Wathlingen salt dome for better understanding the structural evolution of salt diapirism. The model is constrained from geological and borehole information. The model results are compared with local geology that allowed us to conclude that the joint modeling of gravity gradients to deduce 3D density structure fundamentally change the role of gravity field measurements and modeling in subsurface investigations