



## **A fast quantitative three dimensional model of sedimentary basin formation and evolution**

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With the establishment of regional scale data sets such as basin-wide thickness maps of sedimentary sequences it is important that quantitative modelling methods also can be applied on a regional scale with a reasonable response time. This paper presents a fast three dimensional numerical model of basin formation and evolution incorporating the following processes: lithospheric extension, sedimentation and compaction, erosion and thermal events, including magmatic or plume activity.

Isostatic compensation is laterally distributed using an elastic thin plate. Lithospheric thinning and heating is allowed to vary through any point in time and space. Solution of the three dimensional heat equation is based on finite difference methods, while the flexure problem is solved using spectral methods.

The method is applied to the formation and evolution of the North Sea basins. Assuming rifting in Late Carboniferous/Early Permian, the post rift thermal subsidence can explain the development of the northern and southern Zechstein basins and also accommodates the majority of the Triassic sequence.