# Basin inversion and fold-thrust belt evolution at the Varsican stretched passive continental margin in SW Ireland. Insights from 3D modelling.

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The computer-based application of modern structural concepts has led to a considerably improvement in the understanding of fold-thrust belt evolution and basin inversion of the stretched passive continental margin of the external Variscides in Ireland. Detailed structural analysis integrating geophysical and outcrop data and 3D strain analysis result in a model of dextral transpression during fold-thrust belt evolution. Thermobarometric studies lead to deformation related peak metamorphism of up to 320°C and 3.5kbars in the south (the Devonian Munster Basin) and up to 280°C and 2.5kbars north of the Munster basin.

A numerical 3D backward/forward modelling approach was made to analyse the influences of a major basin margin (of the Munster basin) on the evolution of an orogenic wedge. It could be shown that the basin geometry and the fault-bounded northern margin strongly varies in 3D depending on the structural heterogeneity of the Lower Paleozoic basement. During convergence the basin margin faults were mostly reactivated but both hanging-wall and foot-wall short-cut faults developed. The basal detachment of the fold-thrust belt climbs up along this basin margin from 8-13km in the south to 4-6km in the north. All data were processed digitally using *AutoCAD* and *3DMove* software to build a consistent and comprehensive 3D model. Kinematic modelling improved the determination of the detachment topography, the role of basin margin faults and the kinematic evolution during Variscan convergence.