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## Tectonic stylolites as a valuable stress archive – new insights from Late Cretaceous intra-plate stresses in Europe

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The importance of paleostress analysis is dramatically increasing due to its application in diverse fields, such as sustainable exploration of resources, reservoir potential or storage sites. A good understanding of the subsurface geology, the geological stress-history and associated fracture and fault networks is essentially for these applications. Understanding of the complete paleostress history is not only of interest for applied research, but also for an understanding of the dynamics of geological processes in general. In recent years a diverse toolbox of stress inversion methods has been developed including stress inversion from tectonic stylolites (and slirolites). The pressure solution structures not only preserve the direction of the largest principle stress – they are an archive for the complete stress tensor and the absolute stress magnitude at the moment of their development. Here we present the first results of a systematic study of this upcoming method. For comparison we performed roughness analysis of tectonic stylolites from Mesozoic limestone from SE Germany. In late Cretaceous the area was affected by shortening in a NE-SW direction, which is clearly illustrated by fault-slip analysis and the orientation of tectonic stylolites. During this tectonic event the stress regime changed from thrusting to strike-slip, with the sampled stylolites persevering the transition between these two stress events. With our preliminary results we show that roughness analysis of tectonic stylolites enables us to record short time intervals during phases of contraction, and therefore offers crucial insights into stress history and tectonic processes with pulsating stress fields.