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Borehole stability analysis in anisotropic rocks using Breakout Analysis for Anisotropic Rocks (BAAR) MATLAB-based code

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The elastic anisotropy of the rock medium e.g. transversely isotropic shale is an important factor affecting stress distribution around the borehole, and by so influencing the initiation and development of compressive and tensile failure zones affecting the borehole stability.

The Breakout Analysis for Anisotropic Rocks (BAAR) code was developed in Matlab for the two-dimensional analysis of stress distribution around the borehole in an anisotropic thermo-poroelastic rock medium subjected to far-field loads.

The comprehensive stability analysis, including numerous failure criteria was conducted for boreholes in the Pomeranian part of the Lower Palaeozoic Baltic Basin with emphasis on the transversely isotropic Sasino and Pasłek shale formations.