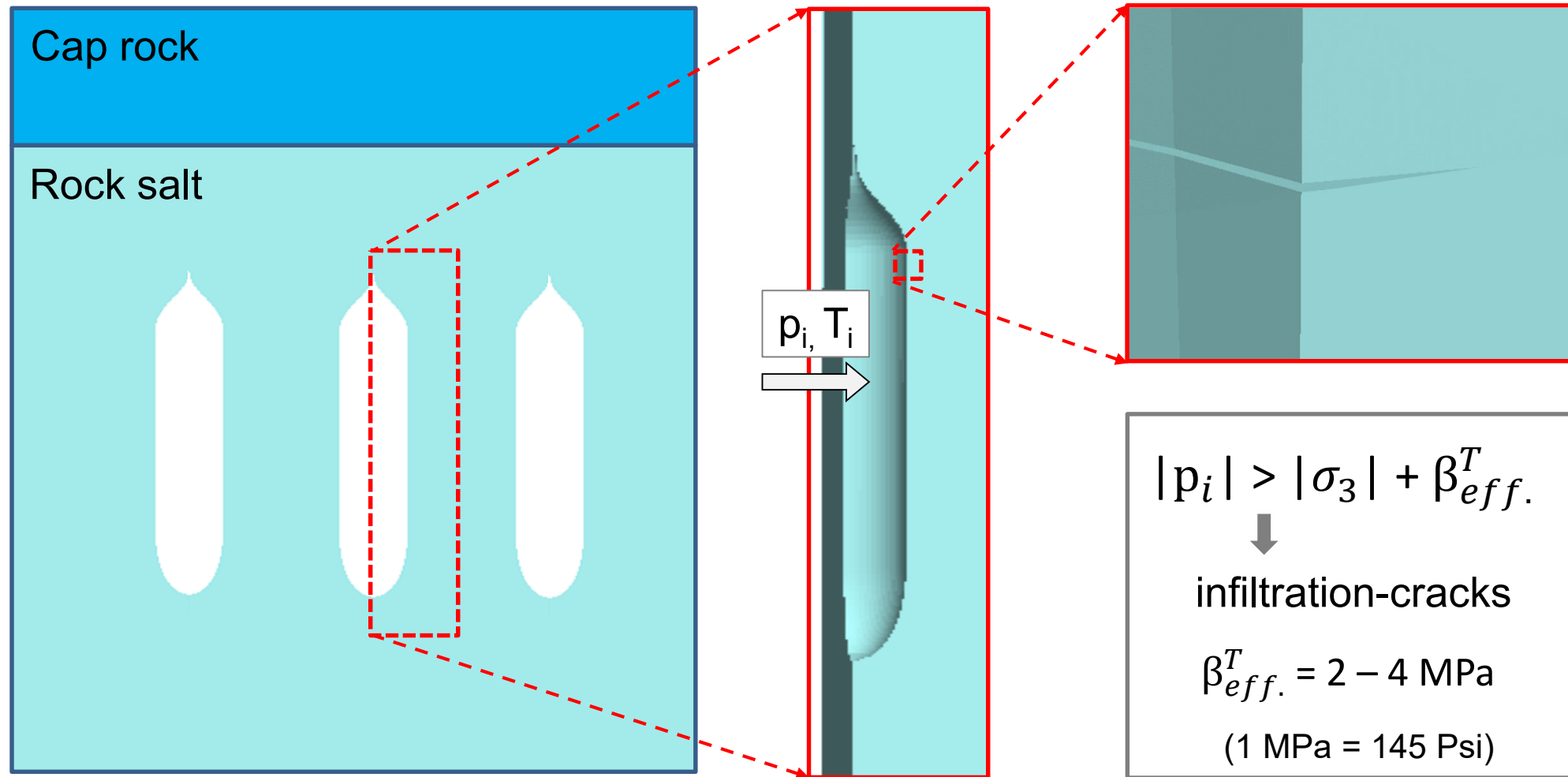


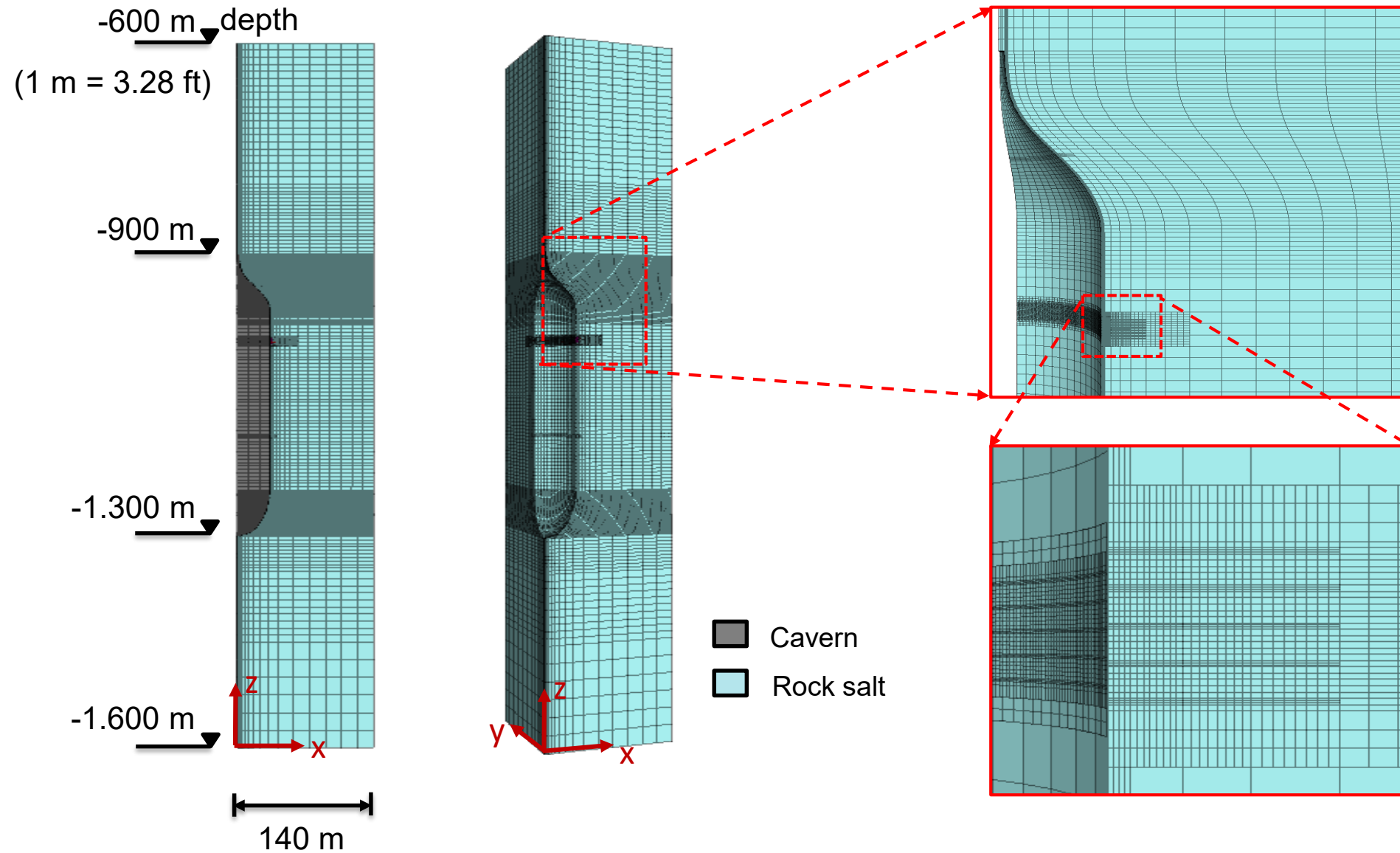
Calculation of Infiltration-cracks in the edge zone of Gas Storage Caverns with FLAC3D

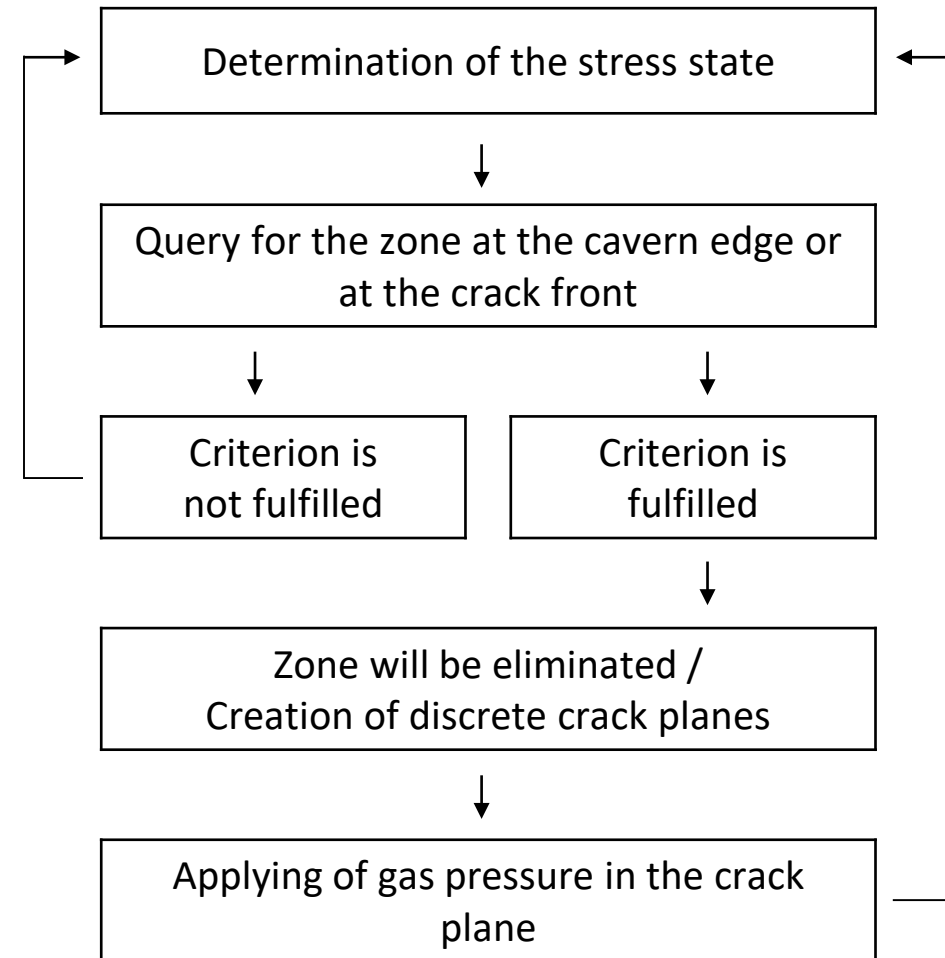
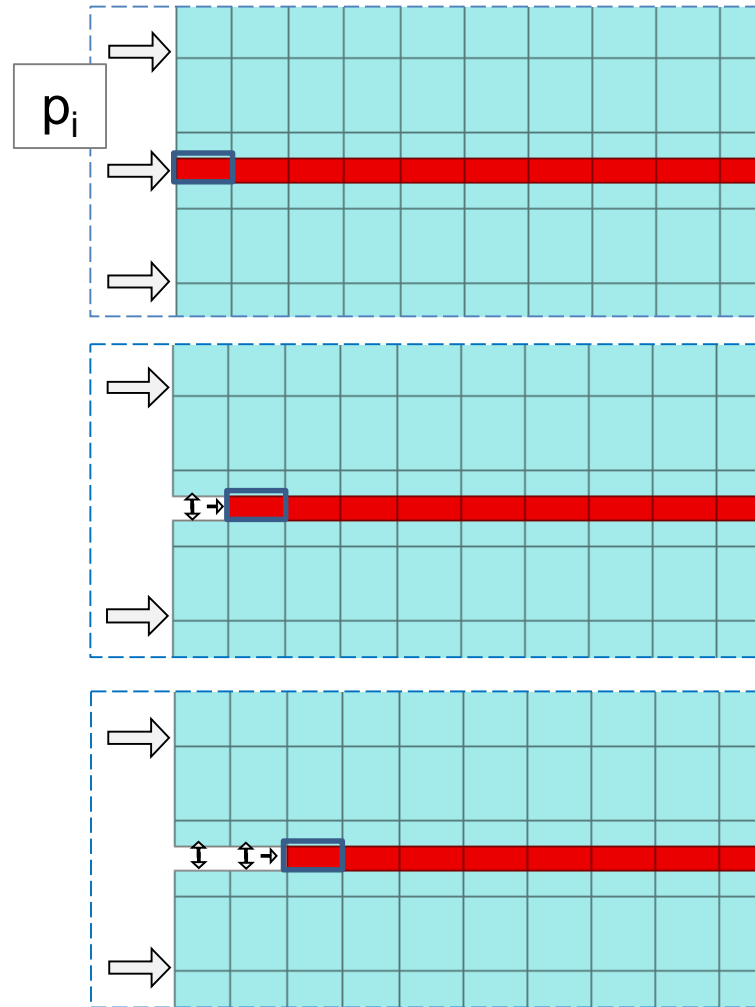
5th International Itasca Symposium

17.02. – 21.02.2020, VIENNA, AUSTRIA



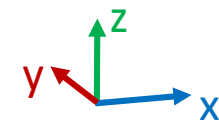
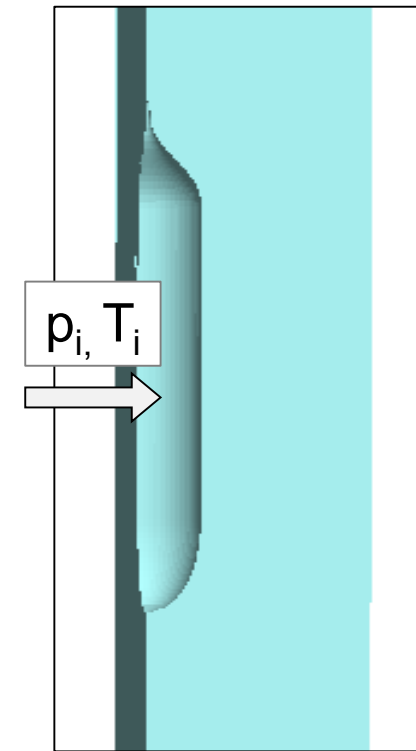
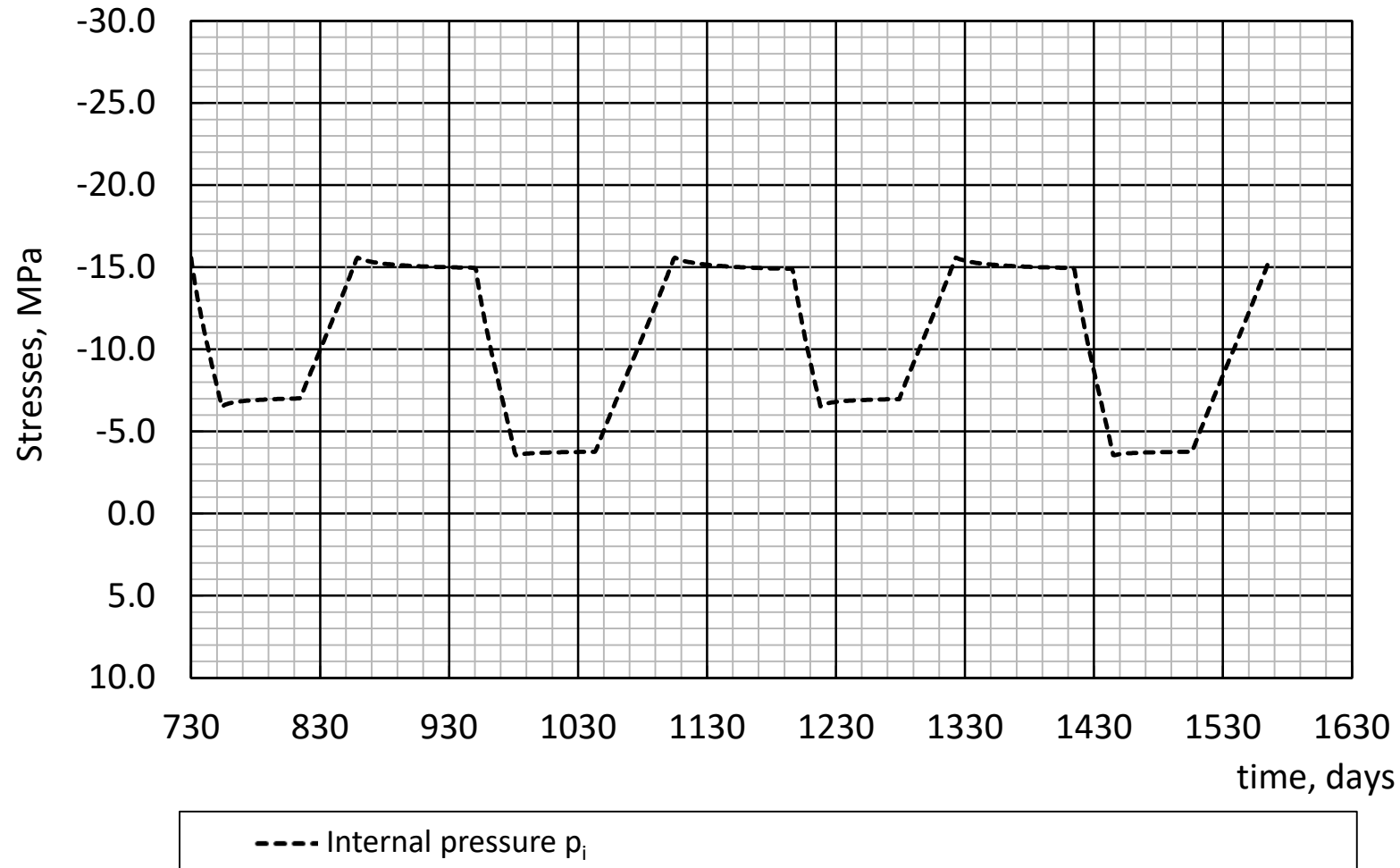






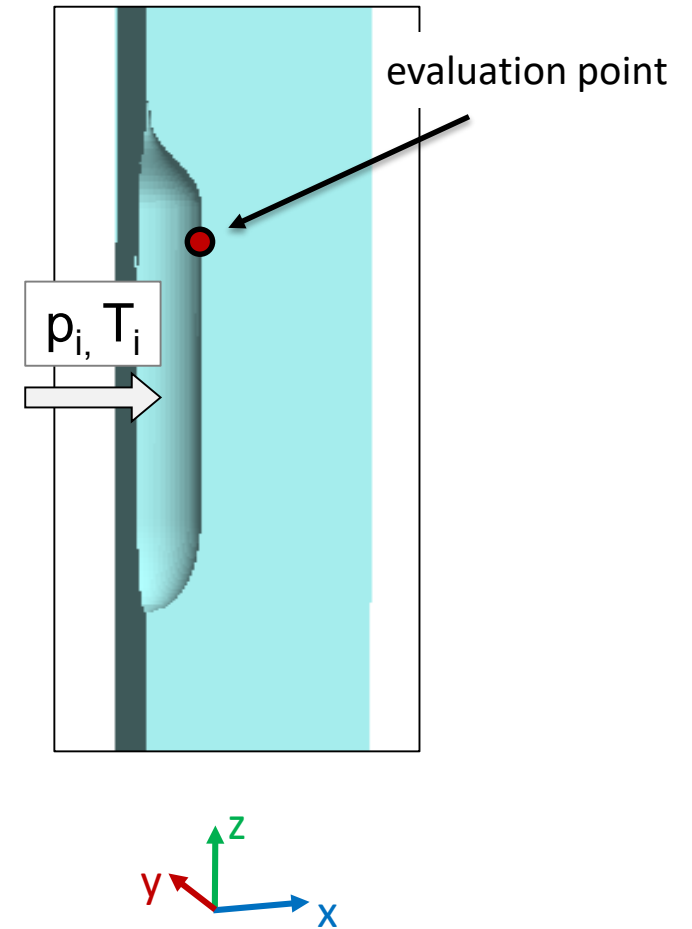
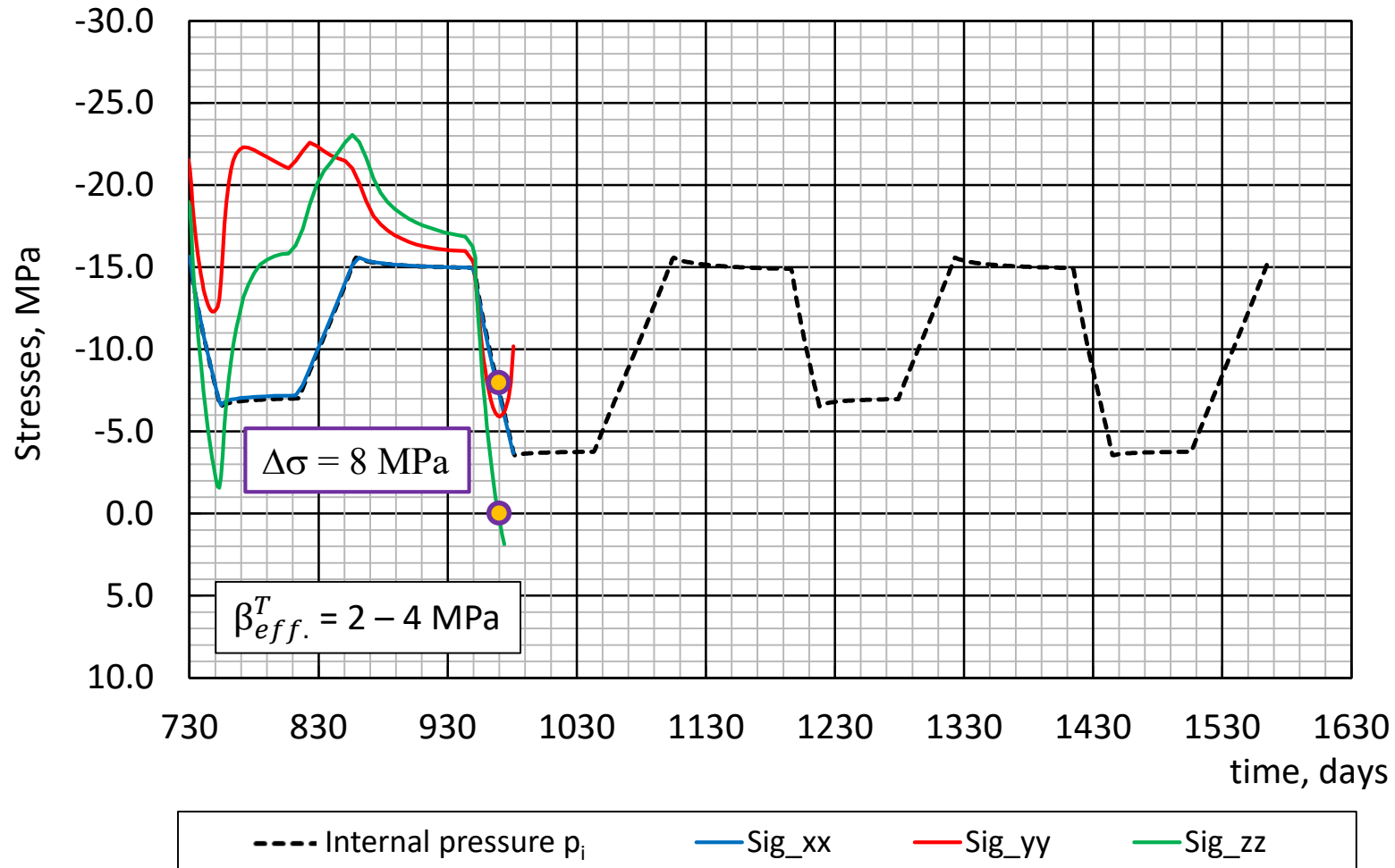
Internal pressure curve

(1 MPa = 145 Psi)



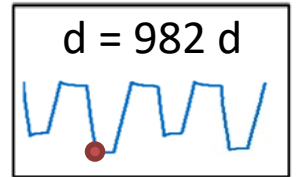
Calculation without discrete crack modelling

(1 MPa = 145 Psi)

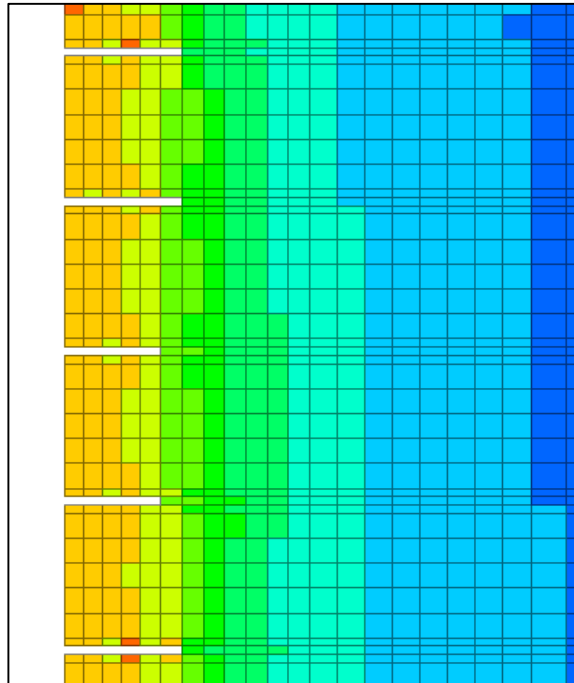


Calculation examples

criterion for crack formation: $|p_i| > |\sigma_{zz}|$

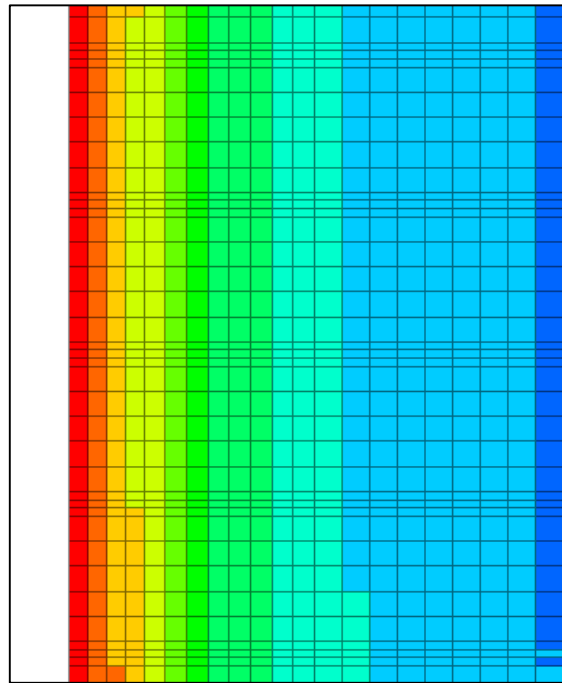


with discrete cracks
(five horizontal cracks)

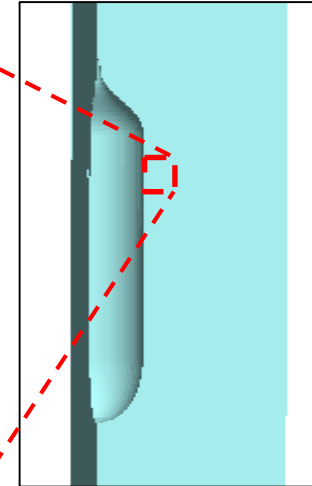


Appr. 1,6 m

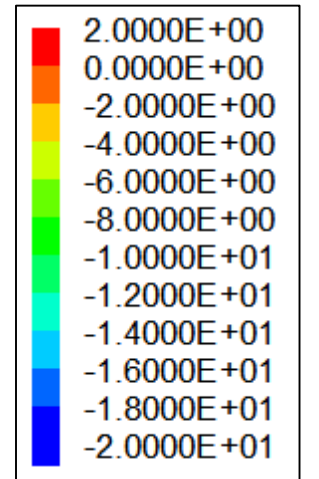
without discrete cracks



evaluation area



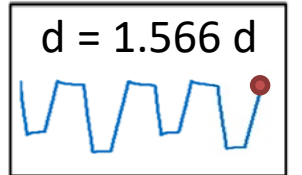
vertical stress
 σ_{zz} , MPa



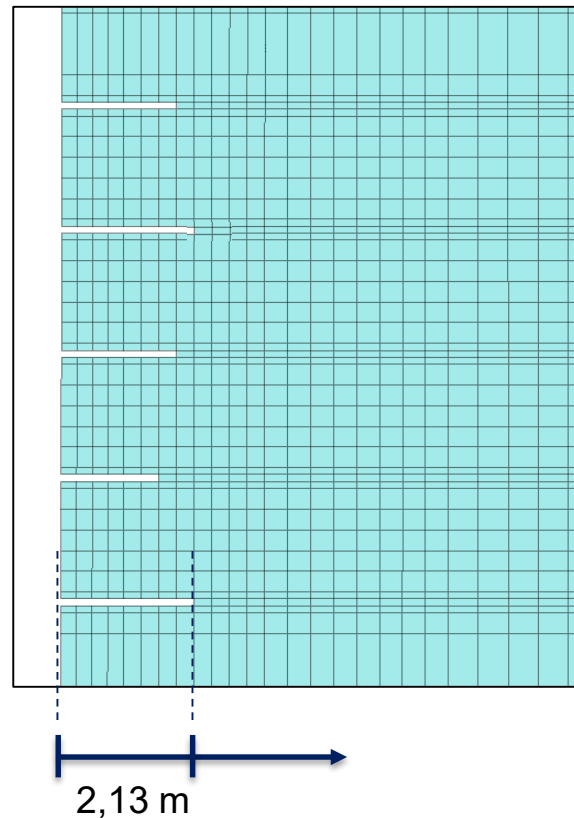
Calculation examples

criteria for crack formation:

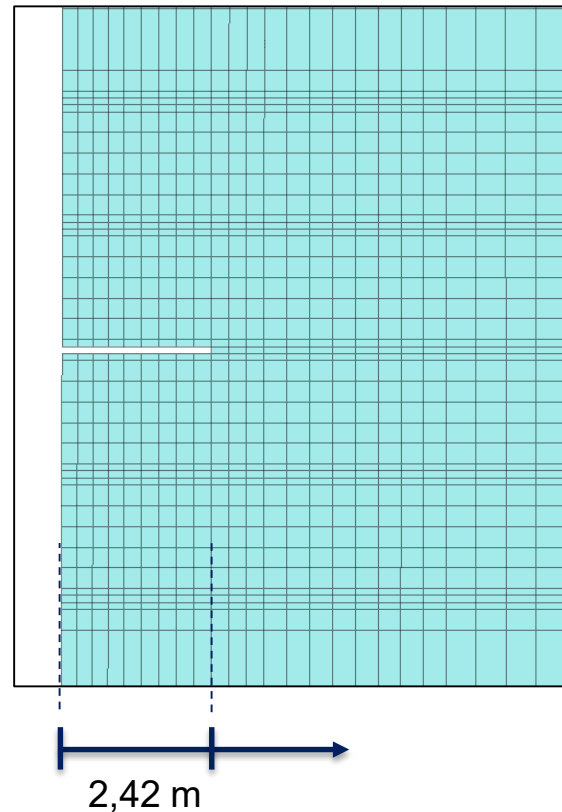
horizontal: $|p_i| > |\sigma_{zz}|$ / vertical: $|p_i| > |\sigma_{yy}|$



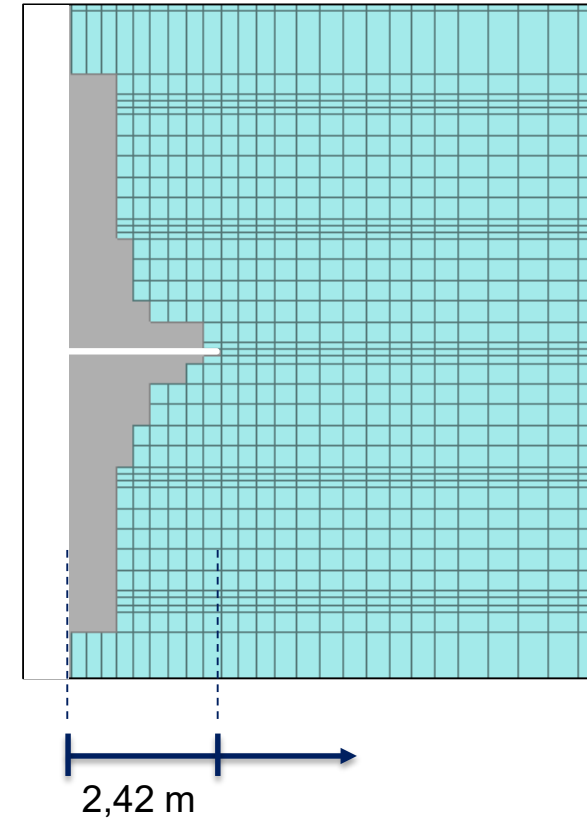
five horizontal cracks



one horizontal crack



one horizontal /
one vertical crack



- formation of infiltration-cracks in the gas cavern surrounding rock salt
- considering in rock mechanical design of gas storage caverns
- suitable models and methods are needed
- method of discrete crack modelling
 - considering of the internal pressure in the crack
 - stress state in the vicinity of infiltration-cracks.