# SKB Aspö UFM application

CIVIL • ENVIRONMENTAL • MANUFACTURING • MINING • OIL & GAS • **POWER GENERATION**

## PROJECT DESCRIPTION

Äspö

Sweden

PFC3D™

H2OLAB

SKB asked ITASCA to apply an advanced modelling framework (UFM) on the Äspö site to estimate its consistency with structural and hydraulic data.

## ITASCA'S ROLE

The UFM modelling framework (detailed in Davy et al., (2010, 2013)) is used to assess fracturing parameters and improve the DFN models in Äspö using in-depth data.

In practice a given set of DFN model parameters is initially related to the spatial volume position and relative dataset from which it is derived. We use both borehole logs and trace mappings along the Äspö tunnel (Figure 1).

The UFM relevancy is assessed through the analyses of fracture densities, trace size distributions (Figure 2) and T terminations statistics.

## PROJECT RESULTS

- The UFM is consistent with tunnel trace maps and fracture densities measured in boreholes and in the tunnel.
- We predict a transition scale between a sparse regime (where fractures do not interact) and a dense regime (where fracture organization is governed by fracture-to-fracture interactions) between 5 and 10 m.

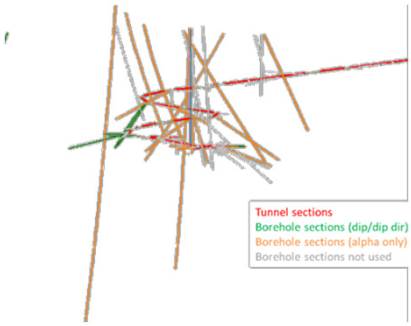


***Figure1 :Overview of datasets from the Äspö area.***

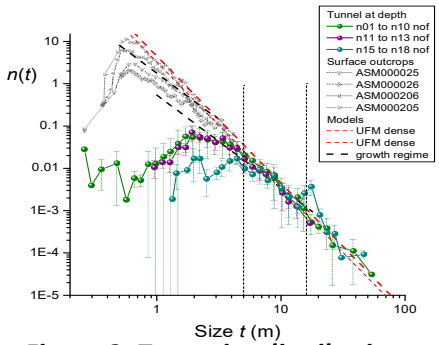


***Figure 2: Trace size distributions from Äspö tunnel data***

## REFERENCES


Davy, P., Le Goc, R., & Darcel, C. (2013). A model of fracture nucleation, growth and arrest, and consequences for fracture density and scaling. J. Geophys. Res.: Solid Earth, 118(4)

Davy, P., Le Goc, R. et al. (2010). A likely-universal model of fracture scaling and its consequence for crustal hydro-mechanics. J. Geophys. Res.: Solid Earth.


ICSAS15-CST-PWR-35161-01


**Itasca Consultants S.A.S.**
**64 Chemin des Mouilles**
**69134 Ecully Cedex, France | +33 (0)4 72 18 04 20 | consulting@itasca.fr**

**www.itascainternational.com**
**www.itasca.fr**