

COLLABORATIVE RESEARCH CENTER 837

## INTERACTION MODELING IN MECHANIZED TUNNELING

RUB

# Methodology for Real-Time Adaptation of Tunnels Support using the Observational Method

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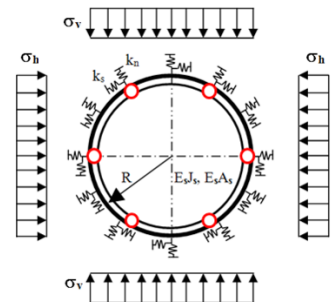
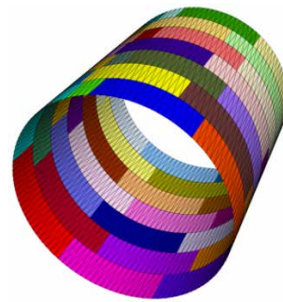
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The observational method in tunnel engineering allows the evaluation in real time of the actual conditions of the ground and to take measures if its behavior deviates considerably from predictions.

However, it lacks a consistent and structured methodology to use the monitoring data to adapt the support system in real time. The definition of limit criteria above which adaptation is required are not defined and complex inverse analysis procedures may be needed to consistently analyze the problem.

A methodology for the real time adaptation of the support systems during tunneling will be presented. In a first step, limit criteria for displacements and stresses will be proposed. The methodology uses graphics that are constructed during the project stage based on parametric calculations to assist in the process and when these graphics are not available, since it is not possible to predict every possible scenario, inverse analysis calculations are carried out. The methodology will be applied to the "Bois de Peu" tunnel which is composed by two tubes with over 500 m long.



It will be showed that the methodology has potential to be applied in real cases contributing for a consistent approach of a real time adaptation of the support system and highlight the importance of the existence of good quality and specific monitoring data to improve the inverse analysis procedure.



Guests are welcome!