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Vortragsankündigung

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Thema: One-sided moistened FRC underground structures

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Kurzfassung

The modern building materials production demands development of materials based on composite structure. The most important factor for developing them is prevalingly the reduction of cost with increasing stress on physical, particularly mechanical and chemical properties of the composite aggregates. The fiber reinforce concrete is one of the most important and promising composite material nowadays. It plays increasingly more important role in structures, such as underground structures, foundations, etc., which are one-sided moistened.

In the frame of investigation of tunnel linings, FRC with Dramix type fibers in a concrete matrix is studied by 3D finite elements. Optimization of slopes is solved. The problem is considered as a contact problem. Because of a priori unknown fiber – matrix interfacial zones, the penalty formulation is tackled. It means that contact double nodal points are created in the possible debonding regions and in elastic stage high penalty is applied. During the increase of the pullout force, the penalty coefficients drop according to the Mohr-Coulomb hypothesis and after exclusion of the normal tensile stress stepping over the tensile strength. The study is carried out depending on volume fiber ratio on a unit cells.

In the presentation behavior of one-sided moistened tunnel linings is observed from experiments and from numerical approaches. Numerical models based on laminated plates, hollow cylinders and arches will be put forward. Eigenparameters technique is used to simulate non-forced loading (temperature, plastic states, damage, swelling, wetting, etc.). Time dependent dehydration during the curing process of a one-sided moistened beam was observed by very precise experiment. From the recorded displacements in selected points the eigenstresses were derived using a coupled modeling. They were included into a computation of stresses. The eigenstresses represented the measure of loss of the water contented in the concrete. Twenty-eight day scale was considered.

Gäste sind herzlich willkommen.

Ass.Prof.Dr. P. Paulini

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