

Final Report

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Home Department: Institute of Basic Sciences in Engineering Sciences

Home University: University of Innsbruck

Guest Department: School of Engineering

Guest University: Cardiff University

From: November, 16th 2019

Until: November, 30th 2019

Title of the Research Project:

Numerical Modelling of Cracking of Fibre Reinforced Cementitious Materials

Report about visit and future plans:

My visit of the research group of Prof. Tony Jefferson at Cardiff University was intended as a kick off meeting for a long term collaboration on the assessment and development of numerical models to predict the failure process of fibre reinforced cementitious materials such as concrete or shotcrete. These composite materials are widely used in civil engineering and possess superior material properties compared to plain concrete or shotcrete in terms of tensile strength, ductility and toughness. Improved numerical methods for describing the material behavior realistically facilitate a more economical and safe design of structures in engineering practice.



During the visit, we discussed possibilities to combine the efforts by both research groups to create improved numerical models for describing such fibre reinforced materials. As a result, we started to develop a new model, which will be developed further during the next months.



Part of the visit was also my guest lecture with the title *Numerical and Experimental Modeling of the Material Behavior of Shotcrete with an Application to Numerical Simulations of the Brenner Base Tunnel*, which I gave to a Master of Engineering class. During this lecture, I presented the numerical methods and experimental studies developed by our research group in the context of the Brenner Base Tunnel project.

