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Master thesis - *Masterarbeit*

for

Vorname Nachname

Student No.: XXXXXXXXX

Thesis received: XX.XX.20XX

Workload: 750 h (25 CP)

Submission of thesis until: XX.XX.20XX

Duration: 6 months

First examiner: Prof. Dr.-Ing. U. Nackenhorst

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Second examiner: Prof. Dr.-Ing. Vorname Nachname

Exploration of bacterial behaviour in soil *Erkundung der bakteriell Verhalten in Böden*

Nowadays, it is a common sense that soil is a living ecosystem and full of micro-organisms. The behaviour of micro-organisms (e.g. growth of biomass, formulation of biofilm, generation of biogas and biologically induced chemical reactions) can modify the engineering properties of soil, which provide potential alternative of solution to a wide range of geotechnical engineering. Before the application of biological processes in engineering problems, the bacterial behaviour in soil should be well understood.

This master thesis will focus on mathematical and numerical analysis of bacterial behaviour in soil. Firstly, a literature review with regard to the current mathematical and numerical models to describe the bacteria behaviour in soil should be done. Based on one or two reviewed models, a simulation on a simple biological mechanism should be carried out based on the FEM code OpenGeoSys.

Required knowledge (to be caught up in self-study where applicable):

(1) This thesis can be supervised/written in English language. (2) Written in English is recommended. (3) Basic knowledge about numerical mathematics, fluid mechanic, programming (e.g. in matlab, python) is required.