

Open PhD Position: Electrical Modelling of the Soil-Root System

Applications are invited for a Doctoral Researcher position in the project „Identifying root structural-functional phenes in sEIT signals by electrical modelling of the soil-plant system“ as part of the DFG funded Cluster of Excellence “PhenoRob: Robotics and Phenotyping for Sustainable Crop Production” (<http://www.phenorob.de>). The aim of the project is the development of an electrical structural-functional soil-root model capable of simulating electrical impedance signatures measured in spectral electrical impedance tomography (sEIT) on soil-root systems. The model will be used for systematic, field-scale scenario analyses to identify root structural and functional phenes in sEIT signals. The project in particular contributes to PhenoRob’s Core Project CP3 (“Putting the soil-root zone into sustainable crop production using sensor data and analytics algorithm”).

The position is to be filled as soon as possible, at the latest from November 1, 2021, for a period of three years.

Your tasks include:

- Development of an electrical soil-root model from the root-segment to the root-system scale
- Modelling of soil-root sEIT responses at the plant scale
- Field-scale scenario analyses for identifying root system phenes in sEIT signatures
- Presentation of results at conferences and publication in peer-reviewed journals

Your qualifications:

- Excellent Master or an equivalent degree in Engineering Sciences, Physics, or Applied Mathematics
- Strong theoretical background in numerical modelling and physical process simulation
- Experience in programming and data management
- Knowledge of geophysics, soil physics, and/or plant physics is of advantage
- Excellent writing and oral communication skills along with the ability to work within an interdisciplinary research team

We offer:

- An open, stimulating and interdisciplinary working environment
- The opportunity of conducting research towards a PhD
- Opportunity to attend international conferences and for a research stay abroad with a cooperating partner
- Specialized courses, summer schools, seminars by renown experts
- Salary according to the German Federal pay scale (75% TV-L E13)

Please send your application in electronic form (as a single pdf) with the relevant documentation (including letter of motivation, curriculum vitae, copy of Master’s degree certificate and transcript of record, names and contact details of two referees) to Prof. Dr. Andreas Kemna (E-mail: kemna@geo.uni-bonn.de) and Prof. Dr. Andrea Schnepf (E-mail: a.schnepf@fz-juelich.de).

The University of Bonn and Forschungszentrum Jülich GmbH are committed to diversity and equal opportunity and aim to increase the number of women employed in areas where women are under-represented and to promote their careers. Therefore, applications from women and disabled persons with relevant qualifications are particularly welcome.