TECHNISCHE UNIVERSITÄT DRESDEN

Fakultät Umweltwissenschaften, Fachrichtung Forstwissenschaften

Institut für Bodenkunde und Standortslehre, Professur für Bodenressourcen und Landnutzung

Technische Universität Dresden, 01062 Dresden

Topic for MSs Thesis

Development of a new method to determine ^{13}C of dissolved inorganic carbon by coupling a high temperature combustion based system to an isotope ratio mass spectrometer

Dissolved organic and inorganic carbon (DOC and DIC) are important components of the carbon cycle in terrestrial and aquatic systems, and play a prominent role in many biogeochemical processes and ecosystem functioning. Stable isotope analysis ($\delta^{13}C$) of DOC and DIC could provide valuable insights in its origin and dynamics. Therefore, precise and routine analysis of $\delta^{13}C$ and concentration of DOC and DIC are highly desirable. Recently, a new promising system was developed and extensively tested for DOC (Federherr et al. 2014, Kirkels et al. 2014) but DIC has to be developed and tested yet. The analysis of both $\delta^{13}C$ of organic and inorganic carbon will give comprehensive insights into the origin and fate of carbon in terrestrial and aquatic ecosystems.

For this MSc thesis research we are looking for a student interested in analytical instruments and chemical analysis related to the natural environment. The project will be done in close collaboration between the University of Amsterdam and TU Dresden (campus Tharandt) including a stay abroad. The company Elementar will support the travel of the student.

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References:

Federherr, E., Cerli, C., Kirkels, F.M.S.A., Kalbitz, K., Kupka, H.J., Dunsbach, R., Lange, L., Schmidt, T.C. (2014) A novel high temperature combustion based system for stable isotope analysis of dissolved organic carbon in aqueous samples (I): development and validation. Rapid Communication in Mass Spectrometry, 28, 2559–2573.

Kirkels, F.M.S.A., Cerli, C., Federherr, E., Gao, J., Kalbitz, K. (2014) A novel high temperature combustion based system for stable isotope analysis of dissolved organic carbon in aqueous samples (II): optimization and assessment of analytical performance. Rapid Communication in Mass Spectrometry, 28, 2574–2586.

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