

Lothar-Collatz-Seminar

Wed, 05. June · **11:00** · Geom 241

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Modelling, simulation and optimisation of a SWRO-PRO hybrid system

Abstract:

Reverse osmosis (RO) is the most widely used membrane based desalination technology. However, it still requires a lot of energy to produce freshwater. The highly concentrated rejected solution of the RO process can be used for Pressure retarded osmosis (PRO). Therefore, a RO-PRO hybrid system could potentially reduce the specific energy consumption (SEC) of the system. In this work we are modelling a membrane unit for both RO and PRO. In this mathematical model we describe the important flow quantities along the length of the membrane. For a realistic approximation, we include internal concentration polarization (ICP) and external concentration polarization (ECP) effects. Together with a model for a modern Energy recovery device (ERD), we are able to implement and simulate a full RO-PRO hybrid system. Finally, we optimize the operating pressures of a conventional RO system and the operating conditions of a hybrid system.

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www.c3s.uni-hamburg.de/news-events/seminar-c3s.html

