Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

Comprehensive Study of Performance and Efficiency of Water Desalination with Capacitive Deionization For Various System Configurations YASAMIN SALAMAT, CARLOS HIDROVO, Northeastern Univ — Capacitive Deionization (CDI) is a novel desalination technology which uses an external electric field to remove ions from low salinity water streams. Its ability to recover a portion of the used energy during the desalination phase has distinguished CDI from other common water desalination techniques. CDI process includes different multiscale transport phenomena with associated timescales. In this work, we have studied effects of these time constants on the overall behavior of a CDI system by taking the desalination performance, water recovery ratio and energy efficiency into account. Additionally, we have investigated different regeneration strategies aiming at improving the desalination and energy efficiency of cyclic CDI systems. To obtain comprehensive comparison between different CDI configurations, a new metric has been introduced which encompasses desalination performance and recovery ratio of water and energy.

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Date submitted: 01 Aug 2017 Electronic form version 1.4