

Abstract Submitted
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Enhanced fog collection with electric fields MAHER DAMAK, SEYED REZA MAHMOUDI, KRIPA VARANASI, Massachusetts Institute of Technology — Fog harvesting is a promising source of fresh water in remote areas. However, the efficiency of current collectors, consisting in fine meshes standing perpendicularly to the wind, is dramatically low. Fog-laden flows generally have low Stokes numbers, which leads to the deviation of fog droplets in the vicinity of the mesh wires. Here, we propose to overcome this aerodynamic limitation using a combination of electric fields and specific collecting surfaces. We show that our system largely increases the fog collection efficiency. We study the trajectories of individual particles and use the results to derive a model to predict the collection efficiency of the system. We finally identify and quantify the mechanisms that can limit the collection of fog particles. The understanding of these mechanisms leads us to construct a design chart that can be used to determine the optimal design parameters that should be used in fog collection applications as a function of the field conditions.

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