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Microlysimeter and fog collector measurements in the Namib desert

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The measurement of non-rainfall atmospheric water input (NRWI) consisting of fog, dew and soil water adsorption is extremely challenging as it requires instruments that are accurate enough to detect even smallest amounts of water input of less than 0.1 mm. Microlysimeters have been proven to provide robust and high precision data of NRWI, even in arid environments. We present results from two intensive observation periods (IOPs) from SEP/OCT 2017 and FEB/MAR 2018 conducted in the frame of the Namib Fog Life Cycle Analysis (NaFoLiCA) project. Three out of nine stations of the FogNet measurement network have been equipped with pairs of microlysimeters (adapted self-construction after Heusinkveld, 2006). Together with Juvik-type passive fog collectors (metal mesh wrapped in a cylinder) and standard meteorology measurements (temperature, humidity, wind and radiation), the amount of NRWI for days with/without fog is analyzed. It is shown that days/nights without fog show a constant and persistent diurnal course of NRWI with deposition starting around sunset and evaporation starting shortly after sunrise. Deviations from this curve in microlysimeter data are used, together with measurements of fog precipitation, to analyze more than 20 fog events with respect to duration, intensity and amount of fog precipitation and fog deposition, including additional information from leaf wetness sensors, visibility sensors and a disdrometer at the station of the Gobabeb Research and Training Center. No clear relation between fog precipitation and fog deposition could be observed. However, the relation between microlysimeter data and the smallest disdrometer dropsize distribution class (< 0.125 mm) followed a clear exponential function.