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How vegetation alters the properties of raindrops

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The process of rainfall interception is an important part of the hydrological cycle in many regions. The rainfall which is intercepted by vegetation evaporates into the atmosphere, while throughfall and stemflow contribute to runoff generation, control soil moisture and affect soil erosion. These topics are closely connected to the aims of the ongoing bilateral research project between University of Ljubljana, Slovenian Forestry Institute and TU Wien. The project focuses on the understanding of the effect of meteorological and vegetation characteristics on changes in raindrop microstructure. The rain drop diameter and velocity of raindrops under vegetation, which reach the ground by dripping from leaves and branches as throughfall, are different than diameter and velocity of rain drops above the canopy.

The research is based on the high-resolution disdrometer measurements of open rainfall and throughfall. Measurements are ongoing on three different study sites, including single urban trees and urban mixed forest in Slovenia, as well as maize field in a small agricultural basin (HOAL) in Austria. Collected data are used to determine and compare raindrop distributions and their changes under the vegetation. For each study site the single rain events were selected based on similar properties (i.e. rainfall amount, duration or intensity). The event-based analysis taking into account 5-minute time step was used to determine how different vegetation types influence changes in rain drop size and velocity of throughfall drops in comparison to open raindrops.

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