Raindrop size distributions and storm classification in Mexico City

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Worldwide, the effects of urbanization and land use change have caused alterations to the hydrological response of urban catchments. This observed phenomenon implies high resolution measurements of rainfall patterns.

The work provides the first dataset of raindrop size distributions and storm classification, among others, across several locations of Mexico City. Data were derived from a recent established network of laser optical disdrometers (LOD) and retrieving measurements of rainrate, reflectivity, number of drops, drop diameter & velocity, and kinetic energy, at a 1-minute resolution. Moreover, the comparison of hourly rainfall patterns revealed the origin and classification of storms into three types: stratiform, transition and convective, by means of its corresponding reflectivity and rainrate relationship (Z-R).

Finally, a set of rainfall statistics was applied to evaluate the performance of the LOD disdrometer and weighing precipitation gauge (WPG) data at different aggregated timescales.

It was found that WPG gauge estimates remain below the precipitation amounts measured by the LOD.