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Rainfall interception under a fractal sunshade

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Rainfall interception is a process that redistributes gross rainwater falling onto a canopy of vegetation. It is said that the amount of evaporation by rainfall interception occupy about 10 % to 50 % of annual precipitation, and the evaporation gives a significant impact on air transportation of latent heat. It is necessary to keep observing the amount of rain under trees because how to transport a water vapor and a latent heat to an atmosphere by rainfall interception is unclear yet. However, it is difficult to evaluate the amount of rainfall that evaporate, drips, and runs down through the canopy, because the distribution of trees, leaves, and stems is not spatially uniform. Therefore I observed how much rainfall interception really occurs under an artificial environment to compare the amount of rainfall under a fractal sunshade with unimpeded, regarding a fractal sunshade whose leaf area index is 1 as a simplified canopy. As a result, the interception rate under a fractal sunshade during all raining periods of the observational date is approximately 1% to 9%. It is proved that whenever it rains, a rainfall is intercepted by a fractal sunshade and some intercepted rain evaporate over or through the fractal sunshade, because the rain is always intercepted and the amount of a total rainfall is more than under that of a fractal sunshade, or the interception rate is always over 0%.

Last year, I presented that a bulk formulation is often used for a calculation of sensible heat, and suggested that a bulk exchange coefficient of sensible heat expresses not a turbulent diffusion but a rate of heat transport by heat conduction. Actually, a calculation of latent heat uses also a bulk formulation. To determine the amount of latent heat transportation from this study is also related a bulk exchange coefficient.

Keywords: rainfall interception, latent heat, bulk formulation