Characterizing and Quantifying Fog Interception, Energy Distribution and Flux Patterns in a Subtropical Montane Cloud Forest Ecosystem

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The montane cloud forest ecosystem is known to be very productive in the global scale even though its spatial distributions is in very limited regions in the mountain area of tropical and subtropical regions. However, the amount of cloud-water interception by the cloud forest canopy structure remains a big issue for researchers to quantify the physical and ecological environment in such ecosystem. In this study, in order to quantify how the occurrence and formation of upslope cloud/fog affect the cloud-water interception, radiative vertical profiles, and flux patterns inside the canopy volume of the subtropical montane cloud forest, A series of filed experiments and mathematical analysis is being conducted in Chi-Lan Mountain Flux Site in northeastern Taiwan. There are three major research objectives to accomplished in this proposed project on a three-year basis. First, this study is trying to quantify the amount of cloud-water interception collected by the canopy volume, and establish the relationship between the cloud-water interception and the environmental factors (temperature, humidity and wind components). Second, this study analyzes the allocation and dynamics of radiative components (direct beam and diffuse radiation) throughout the canopy volume under the influences of upslope cloud/fog. Finally, this study applies the Eulerian CSO methods to quantify the scalar exchanges and flux patterns in the cloud forest ecosystem under neutral and stable atmospheric stability conditions

Keywords: cloud-water interception, upslope fog, inverse model, diffuse radiation

