

Variable selection based on entropic criterion and its application to the debris-flow triggering

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Abstract

We propose a new data analyzing scheme, the method of minimum entropy analysis (MEA), in this study. New MEA provides a quantitative criterion to select relevant variables for modeling the physical system interested. Such method can be easily extended to various geophysical/geological data analysis, where many relevant or irrelevant available measurements may obscure the understanding of the highly complicated physical system like the triggering of debris-flows. After demonstrating and testing the MEA method, we apply this method to a dataset of debris-flow occurrences in Taiwan and successfully find out three relevant variables, i.e. the hydrological form factor, numbers and areas of landslides, to the triggering of observed debris-flow events due to the 1996 Typhoon Herb.