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TECHNICAL NOTE: The representation of rainfall drop-size distribution and kinetic energy

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Abstract. To relate observed rainfall rates (R) to the kinetic energy flux (E) that affects soil erosion it is necessary to develop relationships between the two. This paper explores theoretical E–R relationships based on gamma distributions of drop size. The relationship is poorly defined unless assumptions are made about changes in the shape of the drop-size distribution (DSD) with rainfall rate. The study suggests that the assumption of an exponential DSD leads to overestimation of kinetic energy flux. Further, incorporation of a horizontal component of kinetic energy allows for a clearer relationship between kinetic energy and rainfall intensity to be defined, but a question remains regarding the most appropriate definition of the horizontal component of drop velocity.

Keywords: drop-size distribution, drop kinetic energy, soil erosion

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