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Hydrol. Earth Syst. Sci., 8, 1001-1007, 2004

www.hydrol-earth-syst-sci.net/8/1001/2004/

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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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Citation: Fox, N. I.: TECHNICAL NOTE: The representation of rainfall drop-size distribution and kinetic energy, Hydrol. Earth Syst. Sci., 8, 1001-1007, 2004. [Bibtex](#) [EndNote](#) [Reference Manager](#)

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