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## Flood frequency estimation by continuous simulation (with likelihood based uncertainty estimation)

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**Abstract.** A continuous simulation methodology, which incorporates the quantification of modelling uncertainties, is used for flood frequency estimation. The methodology utilises the rainfall-runoff model TOPMODEL within the uncertainty framework of GLUE. Long return period estimates are obtained through the coupling of a stochastic rainfall generator with TOPMODEL. Examples of applications to four gauged UK catchments are provided. A comparison with a traditional statistical approach indicates the suitability of the methodology as an alternative technique for flood frequency estimation. It is suggested that, given an appropriate choice of rainfall-runoff model and stochastic rainstorm generator, the basic methodology can be adapted for use in many other regions of the world.

**Keywords:** Floods; Frequency; TOPMODEL; Rainfall-runoff modelling

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