

DOWNSCALING IN SPACE-TIME MODELLING OF RAINFIELDS USING THE STRING OF BEADS MODEL

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The String of Beads model (SBM) is a space-time model of rainfields developed to model the rainfields measured by weather radar. It mimics the intensity on a 128 km square (or larger) at a space resolution of 1 km pixels at time intervals of 5 minutes. The “String” of the model is the 1-D time series of wet and dry intervals; the “Bead” is the 2-D space + time model of the rainfall process during a wet period. The model can be used for: simulation, nowcasting and for conditional simulation of rainfields in conjunction with ordinary kriging. Results of verification and validation tests are presented, demonstrating the close statistical resemblance of the modelled to the measured rainfield sequences. The presentation highlights the procedures adopted as candidates for critical tests, useful for developing benchmarks for comparing stochastic rainfall models. More specifically, these consist of measuring the marginal distributions and correlation in space and time: aggregating over a range of intervals in space, increasing in size from the pixel to the image scale and aggregations in time, increasing from 5 minutes to 48 hours. Intra- and inter-annual validation tests are also suggested for coarser aggregations. These include comparison of modelled with historical rare (100 year) storms, annual total areal rainfalls etc.