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A wavelet-based spatial verification approach to account for the variation in scale representativeness of observation networks

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Forecasts defined over spatial domains are often characterized by a coherent spatial structure and the presence of features. Verification methods ought to account for this intrinsic spatial structure. When observations at specific geographical locations are used for the verification, this issue becomes particularly challenging because of the variation in scale representativeness of the observation network across the domain.

This study addresses some of the issues related to the verification of spatial precipitation forecasts against a network of gauges unevenly distributed in space. A new wavelet-based method to reconstruct a precipitation field from sparse gauge observations is introduced. The reconstructed fields are used to perform a scale-oriented verification and compare the Canadian Precipitation Analysis versus its GEM 15 background model.