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New approaches for rainfall ensemble post-processing with a focus on extreme and rare events

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Ensemble forecasts of rainfall are very important for decision making such as storm warnings or flood risk downstream watersheds. We present a statistical post-processing method based on an extension of Quantile Regression Forests (QRF) for heavy-tailed distributions.
Our proposed method is applied to daily 51-h forecasts of 6-h accumulated precipitation from 2012 to 2015 over France using the Météo-France ensemble prediction system called PEARP. It provides calibrated predictive distributions and competes favourably with methods like Analog method or EMOS, which we try to improve using some new predictors and distributions derived from hydrology. We also discuss about evaluation of ensemble forecasts for extreme and rare events. Our goal is to improve drastically ensemble quality for these events subject to a good overall performance.