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## On the usefulness of considering the run-to-run variability for an ensemble prediction system

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The run-to-run variability of numerical weather prediction systems is at the heart of forecasters' concerns, especially in the decision-making process when high-stakes events are considered. Indeed, forecasts that are brutally changing from one run to another may be difficult to handle and can lose credibility. This is all the more true nowadays, as many meteorological centres have adopted the strategy of increasing runs frequency, some reaching hourly frequencies. However, this aspect has received little attention in the literature, and the link with predictability has barely been explored.

In this study, run-to-run variability is investigated through 24h-accumulated precipitations forecasted by AROME-EPS, Météo-France's high resolution ensemble, which is refreshed 4 times a day. Focusing on the probability of some (warning) thresholds being exceeded, results suggest that how forecasts evolve over successive runs can be used to improve their skill, especially reliability. Various possible aspects of run sequence have been studied, from trends to rapid increases or decreases in event probability at short lags, also called "sneaks" or "phantoms", as well as the persistence of a non-zero probability through successive runs. The added value provided by blending successive runs, known as lagging, is also discussed.