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Project IMA: Seamless short-term ensemble prediction at the RMIB

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The density of meteorological observations and the amount of novel data sources have been increasing steadily in recent years. Likewise, more computational power is available than ever before: not just for data processing and numerical weather prediction (NWP), but also for impact modelling. Along with these rising trends in both data availability and modelling capabilities, the requirements for operational forecasting systems are shifting. This shift is apparent from the smartphone user who expects near-real-time updates, to the hydrologist or wind energy provider who needs ensemble predictions to estimate uncertainty. Indeed, the focus is moving from traditional deterministic forecasts towards probabilistic, convection-permitting and rapidly updating forecasting systems.

With project IMA (Japanese for "soon" or "now"), the RMIB wants to anticipate these evolving expectations. We will leverage innovative nowcasting, blending and data assimilation techniques to combine data-driven probabilistic short-term predictions with convection-permitting NWP models. The goal is to have a seamless high-resolution probabilistic short-term forecast (24 hours).

We will present some of the building blocks of the IMA system. The short-term ensemble prediction system for Belgium (STEPS-BE) is a key component. It generates probabilistic precipitation forecasts, and features an adaptive skill-dependent blending with NWP forecasts. These NWP forecasts will come from a multi-model mini-EPS, based on different convection-permitting configurations of the ALADIN model.

Finally, we stress that the key to success for project IMA is not just the science behind it. Its success also hinges on effective communication with end users, quality assurance through probabilistic verification, and the robustness of the operational system.