An ensemble assimilation and forecast system for 1D fog prediction

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Two high resolution numerical 1D models, namely COBEL and PAFOG, have been adapted to compute a probabilistic fog forecast. To deal with the large uncertainty inherent to fog forecasts, a whole ensemble of 1D runs is computed using the two different numerical models and a set of different initial conditions in combination with distinct boundary conditions. Initial conditions are obtained from variational data assimilation, which optimally combines observations with a first guess taken from operational 3D models. The design of the ensemble scheme computes members that should fairly well represent the uncertainty of the current meteorological regime. Verification reveals that the probabilistic forecast has the potential to support the forecaster and therefore to improve the visibility forecasts.