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Road weather forecasting in Météo-France

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During winter, snow or ice presence on the road might have serious consequences on road traffic and security. For example, in urban areas several centimetres of snow are sufficient to stop totally road traffic and limit consequently economical activity. So this is a major problem and consequently many efforts were done for several years to develop decision-making tools for road management in winter. For this purpose, Météo-France uses in an operational way specific systems dedicated to road weather forecast.

The first one, OPTIMA is a high-frequency (5 min) nowcasting system providing 1 hour forecasting and based on data fusion approach. So it is dedicated to real time and short range anticipation of road impacting phenomenon. It was specially developed for road context and consequently the forecast is done at the road network resolution (with a 5km resolution). The basis concept of OPTIMA is to use all the available data for the forecast process:
-Radar observation and nowcasting (with the same 5 min time step)
-Surface observation network
-Best available weather forecast (i.e. expertized by human forecasters)
-Specific road weather forecast and road weather stations observations

For mid-range forecasting (3 days), Météo-France use in an operational way specific road models (ISBA-Route and ISBA-Route/CROCUS) which permit to simulate the behaviour of a road under the influence of atmospheric conditions and the behaviour of the snow deposited on the road and its characteristics (height, density, liquid water content,...). Since the 2012/2013 winter, a new approach for winter road conditions forecasting was implemented. Road models are forced by human expertised atmospheric forecast instead of a direct coupling with numerical weather prediction models. These systems, called PEIR (Expertised Predictions for ISBA-Route), are operationally used to predict road surface temperature, water and ice content and to provide additional information concerning snow events: snow occurrence, height and type (dry, moist, wet, frozen) on road at the France scale.