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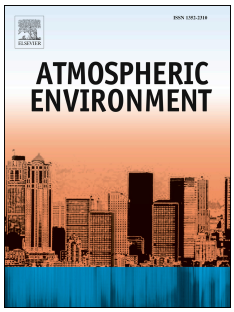

On-line algorithm for ground-level ozone prediction with a mobile station

Juš Kocijan, Dejan Gradišar, Marija Zlata Božnar, Boštjan Grašič, Primož Mlakar

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On-line algorithm for ground-level ozone prediction with a mobile station

Juš Kocijan[a,b], Dejan Gradišar[a], Marija Zlata Božnar[c], Boštjan Grašič[c], Primož Mlakar[c]

[a] *Jožef Stefan Institute, Jamova cesta 39, SI-1000 Ljubljana, Slovenia*
[b] *University of Nova Gorica, Vipavska 13, SI-5000 Nova Gorica, Slovenia*
[c] *MEIS d.o.o., Mali Vrh pri Šmarju 78, SI-1293 Šmarje-Sap, Slovenia*

Abstract

It is important to be able to predict high concentrations of tropospheric ozone and to inform the population about any violations of air-quality standards, as defined by international regulations. Although first-principle models that cover large geographical regions and different atmospheric layers are improving constantly, they typically still only cover geographical regions with a relatively low resolution. Such model predictions can be problematic for the micro-locations of a complex terrain, i.e., a terrain with a large geographical diversity or urban terrain. For such micro-locations, statistical models can be utilised. This paper presents a modelling and prediction algorithm that can be used in, or in accordance with, a mobile air-quality measurement station. Such a mobile station would enable the set-up of a statistical model and a relatively rapid access to the model's predictions for a specific geographical micro-location without a large quantity of historical of measurements. Uncertainty information about the model's predictions is also usually required. In addition, such a model can adapt to long-term changes, such as climate changes. In the paper we propose Gaussian-process models for the described modelling and prediction. In particular, we selected evolving

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