

**Seminarium Zakładu Energetyki Jądrowej i Analiz Środowiska (UZ3)**

**Departament Badań Układów Złożonych (DUZ)**

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CYFRONET (bud. 39), sala 172 (III piętro)

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**Identification of atmospheric contamination source in an urban area by approximate bayesian computation methodology**

**Abstract:**

We present the framework for the identification of the parameters of the airborne contaminant source in the urbanized area. The framework is based on the Approximate Bayesian Computations (ABC) working algorithm to the identification of atmospheric contamination source in an urban environment based on the data reported by multiple sensors. We present the dedicated modifications of the Sequential version of ABC algorithm that improve estimation of the posterior probabilistic distributions of source parameters. The proposed algorithm works in real-time. Estimates of source parameters are dynamically updated with the use of online arriving concentrations of released substance registered by sensors network. We validate the proposed methodology on real data coming from a full-scale field experiment DAPPLE conducted in London. We demonstrate successful estimation of six parameters characterizing the contamination source, i.e., contamination source position (x,y,z) in a city environment, the mass of release (q), the release start time (t) and its duration (l). As the forward model to predict the concentrations at the sensors locations, we utilize the advanced Quick Urban & Industrial Complex Dispersion Modeling system (QUIC), developed by Los Alamos National Laboratory. The obtained results prove the utility of the proposed approach for event reconstruction problem in any complex urban environment with the use of any suitable dispersion model.

Serdecznie zapraszamy,

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