ALPEN-ADRIA UNIVERSITÄT KLAGENFURT

Invitation to the Doctoral Seminar

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"Air Dispersion Modelling"

N.2.35 Wednesday, 6 October 2021 10:00 a.m.

Abstract

Air dispersion modelling has become one of the main tools in the study of air quality whereby it is a key element in most environmental impact assessments. Almost every human activity and natural process leads to some form of air pollution. Therefore, air dispersion modelling is a powerful technique to evaluate whether if a source creates a problem. Considering climate change, sustainable design and planning of our cities is essential, but alpine regions and urban areas pose several problems to the correct investigation of air pollutant concentrations. In general, two different models will be considered, namely the Gaussian Plume Model and the Stochastic Lagrangian Particle Model. The first model assumes that the source emits a constant stream of pollution. Then it can be proven mathematically that the resulting plume will have a Gaussian concentration profile in the lateral and vertical directions. This Gaussian profile will fan out as the distance to the source increases. The second model assumes that each source emits a large number of particles, and each particle follows a random path around the mean wind vector. This path is updated with every time step. Predictions of pollutant concentration are obtained by counting the number of particles in a given volume of air. The goal is to extend the currently used models

to alpine regions and urban areas respectively to different source types, deposition and reflection to predict a concentration profile.

Gunter Spöck and the Department of Statistics look forward to seeing you at the talk!