

Quality Assurance and Improvement of Micro-Scale Meteorological Models

COST Action 732

Michael Schatzmann

Meteorological Institute

Centre for Marine and Atmospheric Sciences

University of Hamburg

A Typical European City (1)



Technical Meteorology



A Typical European City (2)



Technical Meteorology

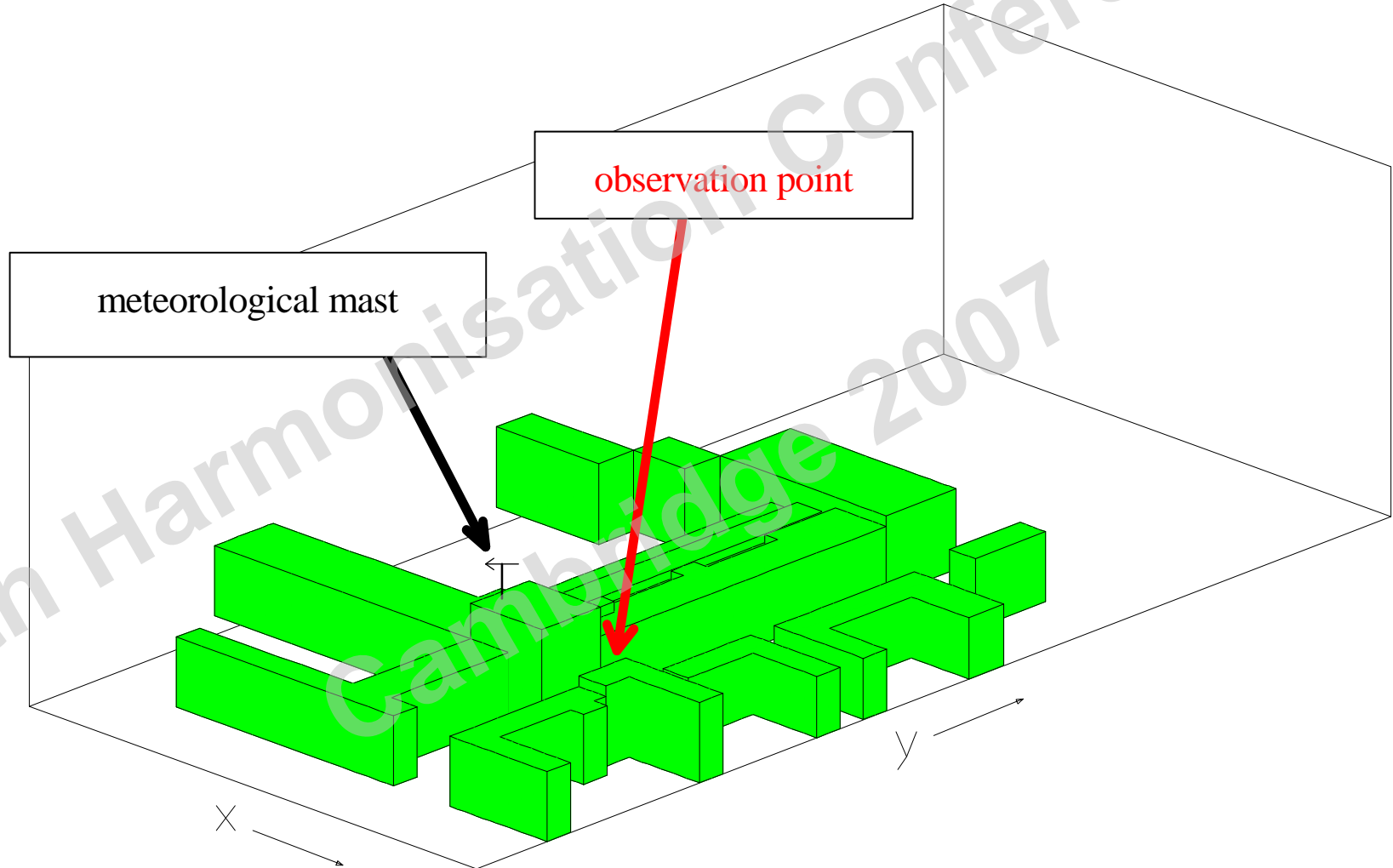


First Statement

- **Do not blindly trust Model Results**

Application of 3 Models to the same Problem

BUILDING ARRAY (Ketznel et al., 2000)

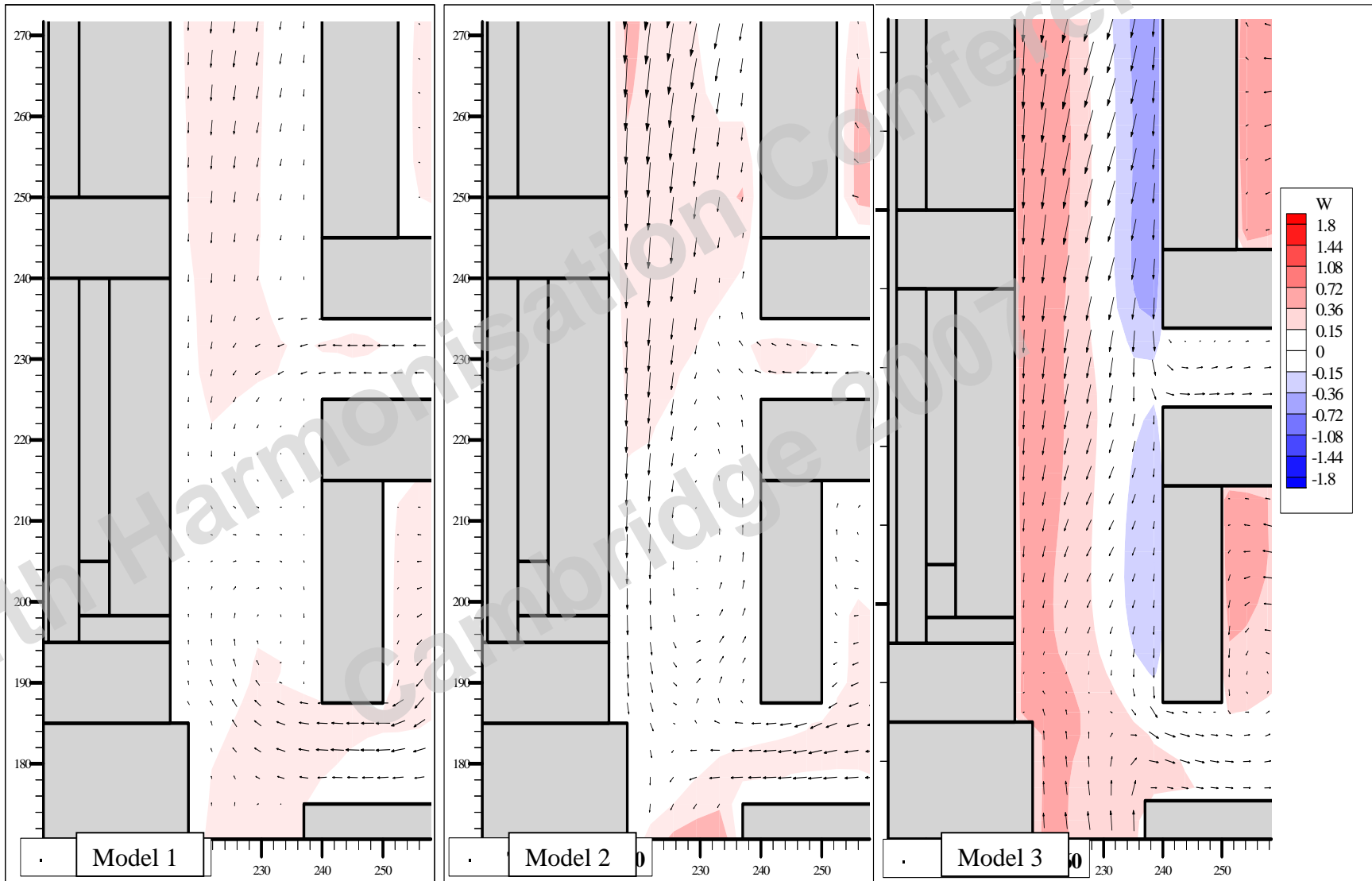




Application of 3 Models to the same Problem

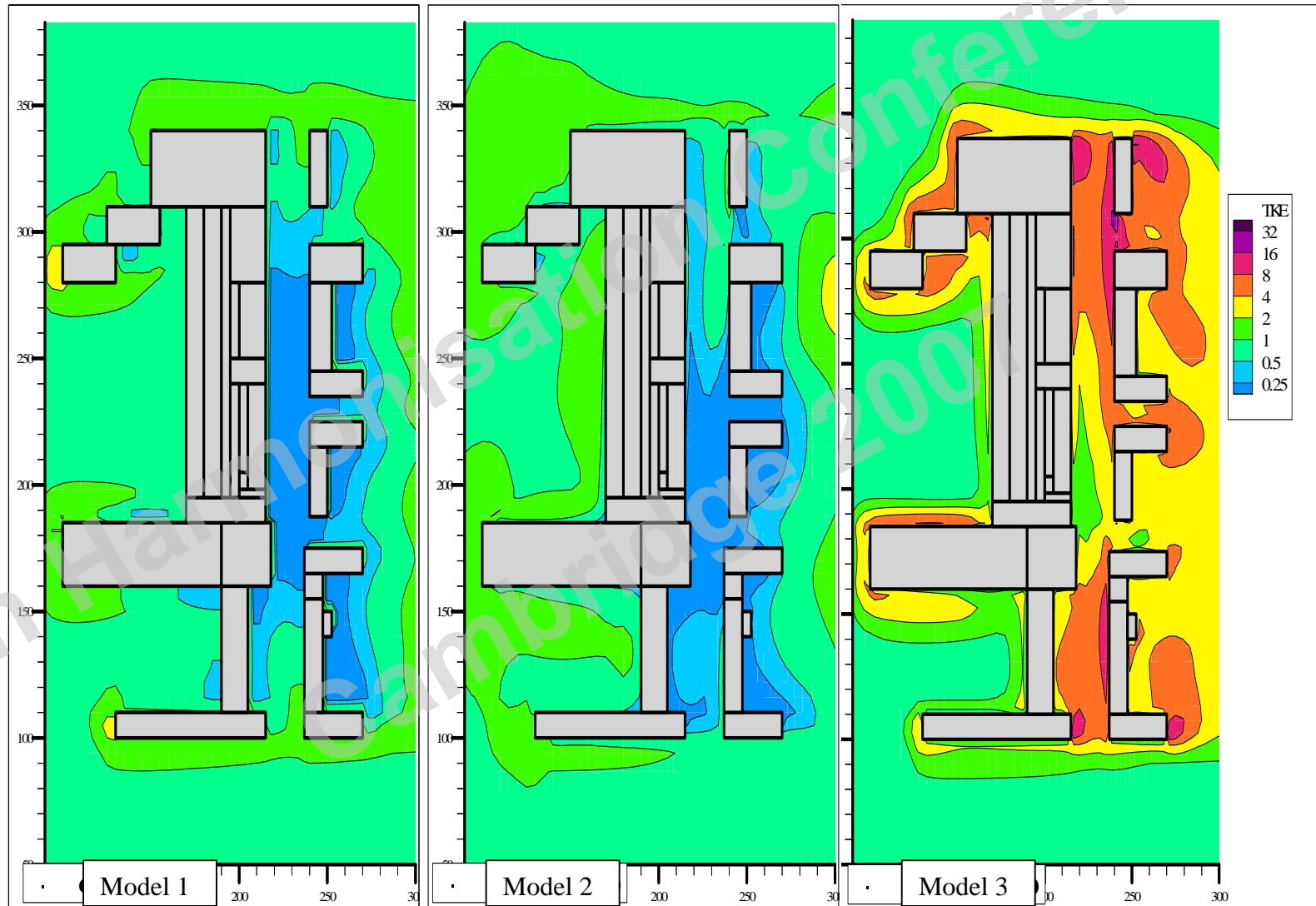
FLOW FIELD for $DD= 260^\circ$, $u,v =$ arrows, $w=$ colours (Ketzel et al., 2000)

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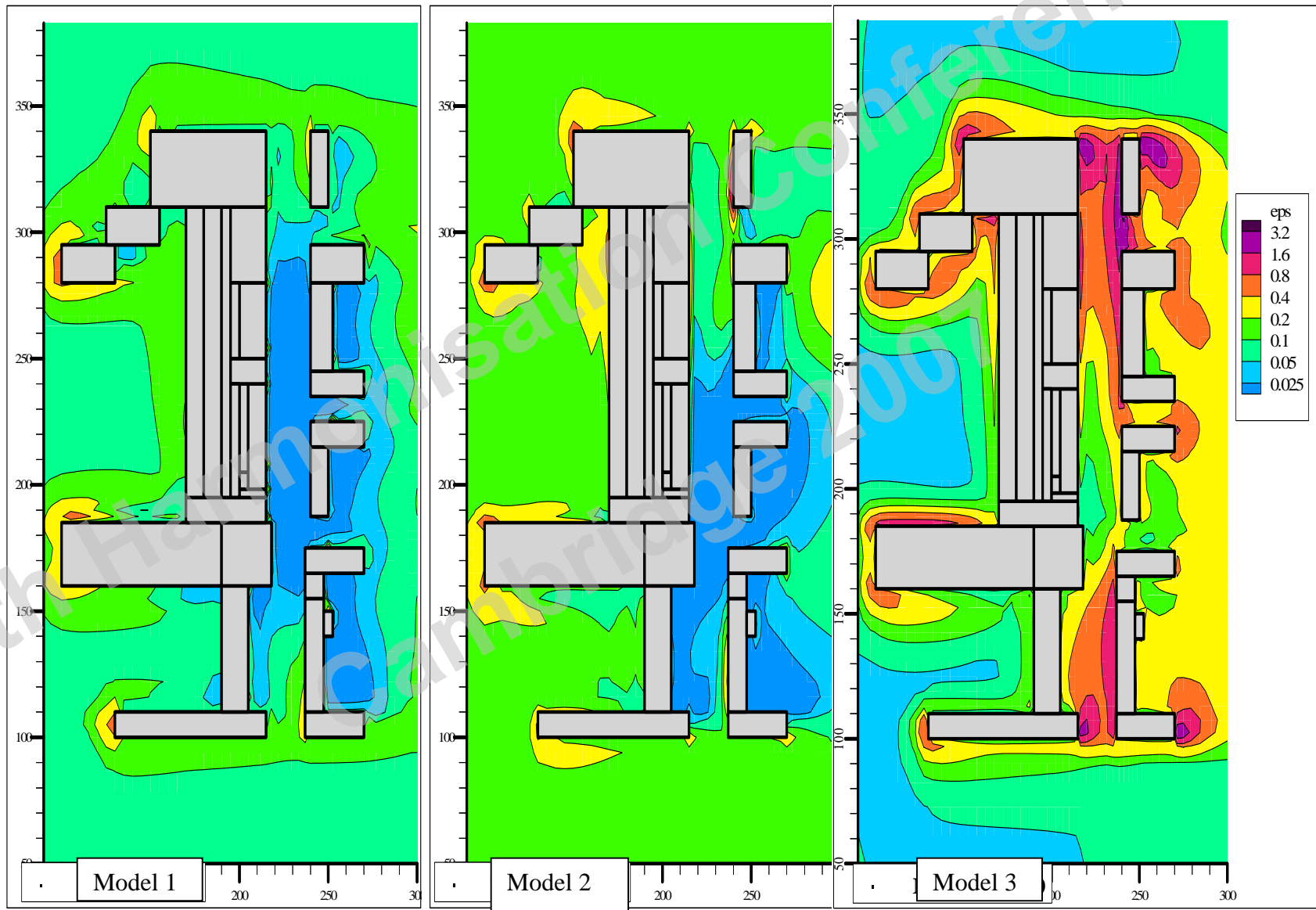
Application of 3 Models to the same Problem

TKE [m^2/s^2] for WD= 260° (Ketznel et al., 2000)



Application of 3 Models to the same Problem

EPSILON [m^2/s^3] for $\text{WD}=260^\circ$ (Ketzler et al., 2000)

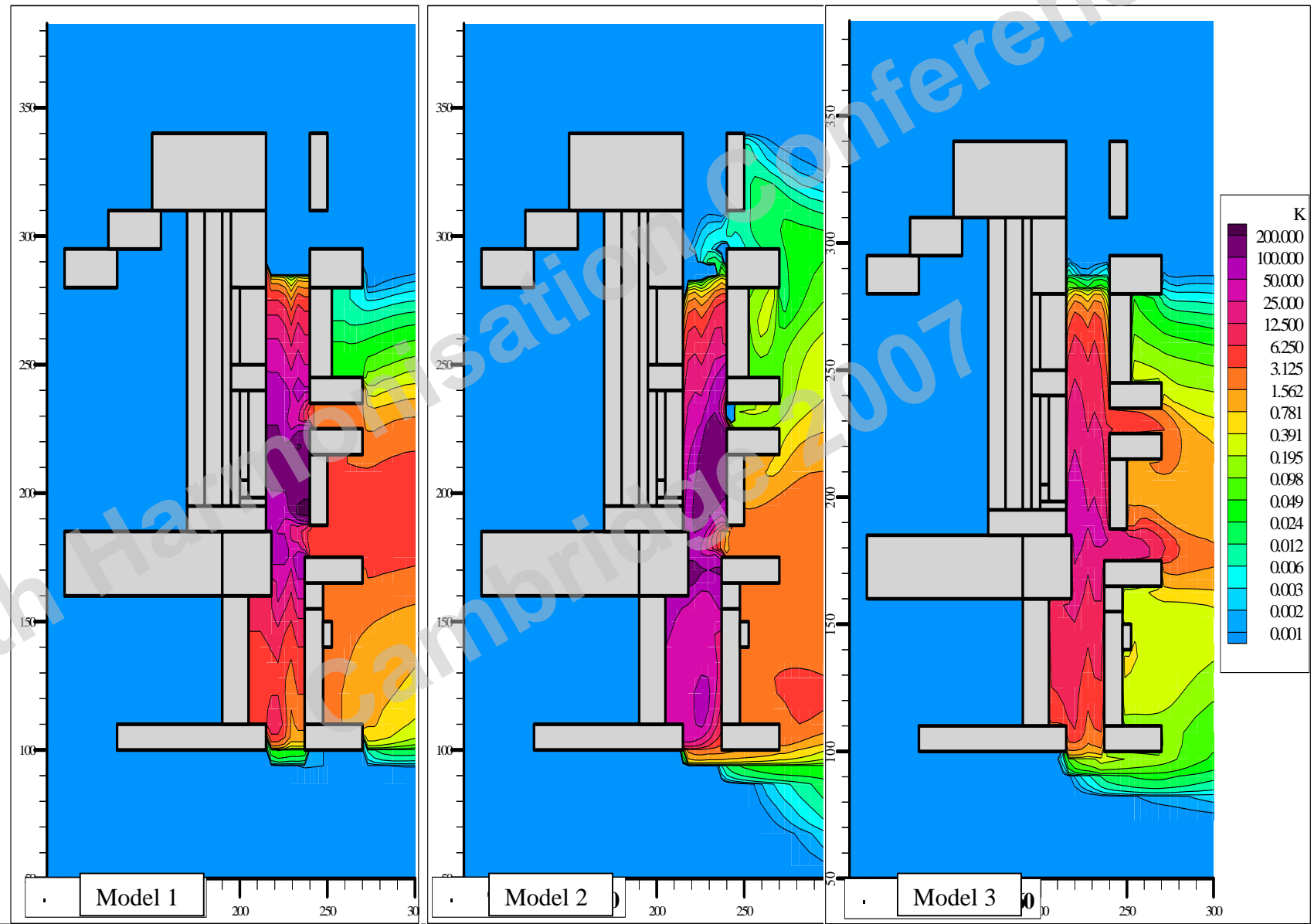




Application of 3 Models to the same Problem

DIMENSIONL. CONCENTRATION C^* [--] for $WD=260^\circ$ (Ketzel et al., 2000)

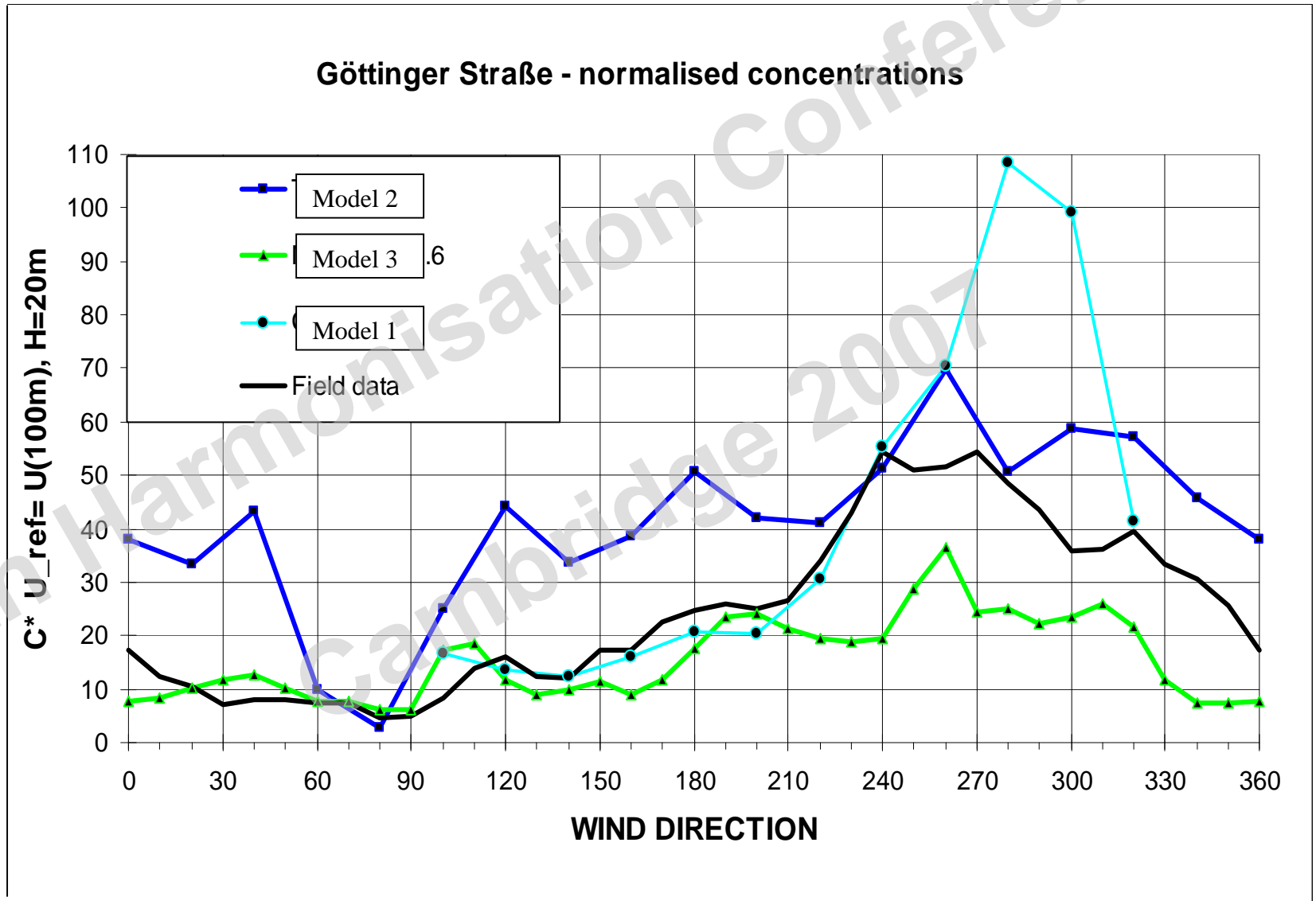
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Application of 3 Models to the same Problem

DIMENSIONL. CONCENTRATION C^* [--] at the monitoring station
(Ketzel et al., 2000)



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Second Statement

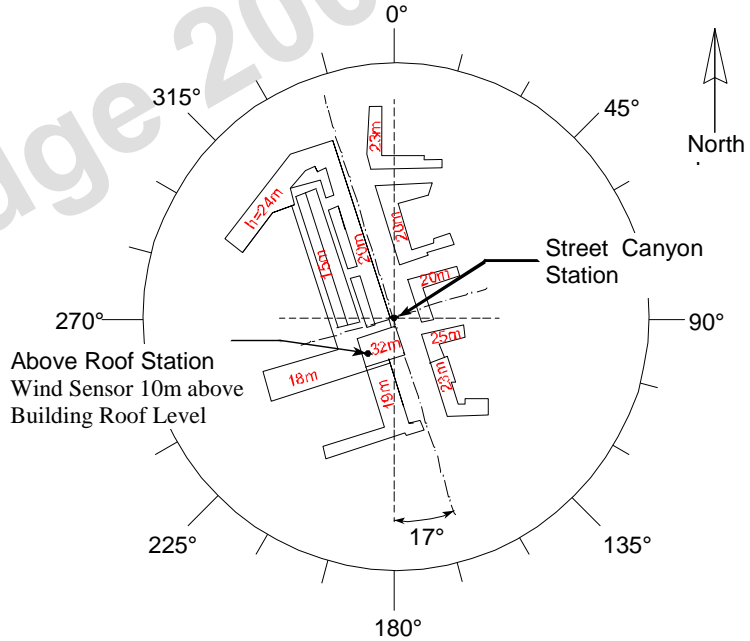
- **Do not blindly trust Data**

Street Canyon Goettinger Strasse in Hanover/Germany



**About 30 000 Vehicles/Day,
about 16 % Trucks**

- Automated Traffic Count**
- Above Roof Wind Measurement**
- In-Canyon Concentration Measurement**
- Background Concentration Measurement**
- Continuous Time Series Since 1990**



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Street Canyon Goettinger Strasse in Hanover/Germany



Street Canyon Goettinger Strasse in Hanover/Germany

Roof Top Station



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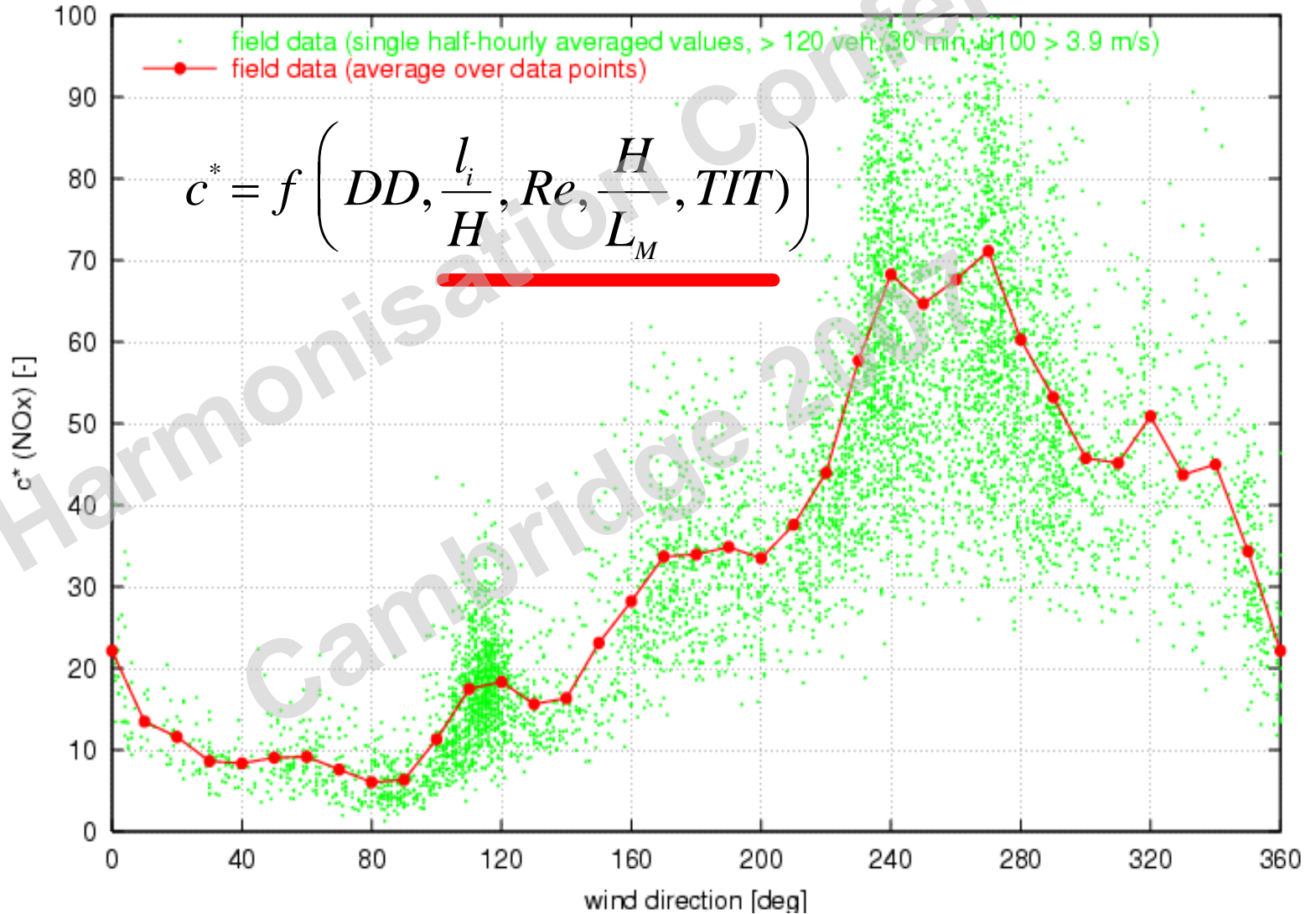


Street Canyon Goettinger Strasse in Hanover/Germany

Presentation of the Filtered 1994 NOx Data Set

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Goettinger Strasse, 1994, NOx



Street Canyon Goettinger Strasse in Hanover/Germany

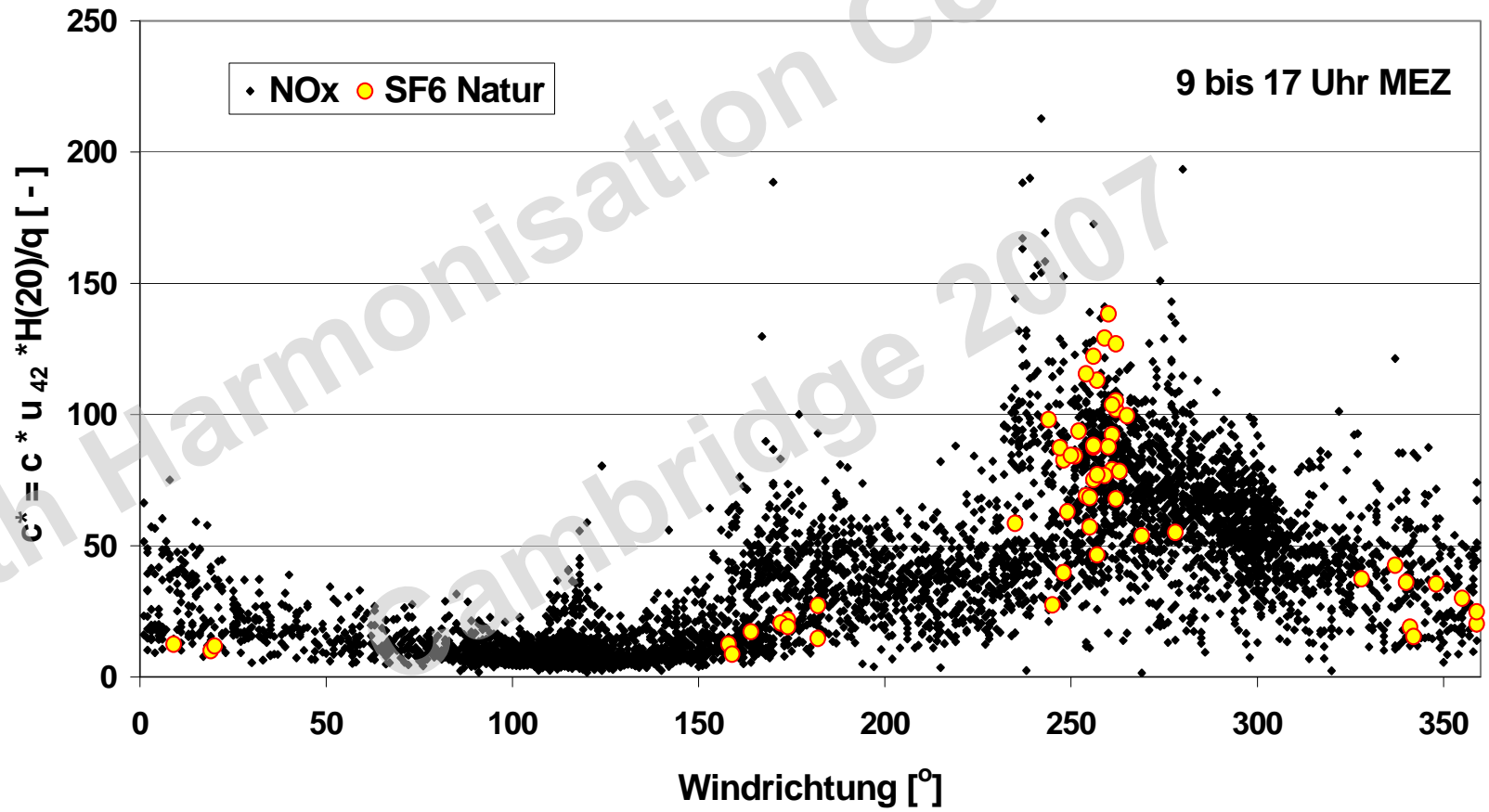
Artificial Line Source, SF6 - Emission



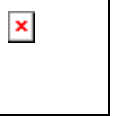


Street Canyon Goettinger Strasse in Hanover/Germany

Artificial Line Source, SF6 - Concentrations from Episodic Measurements (Bächlin et al., 2004)



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Street Canyon Goettinger Strasse in Hanover/Germany

What Flow Visualisation Experiments Reveal

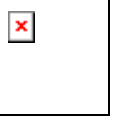
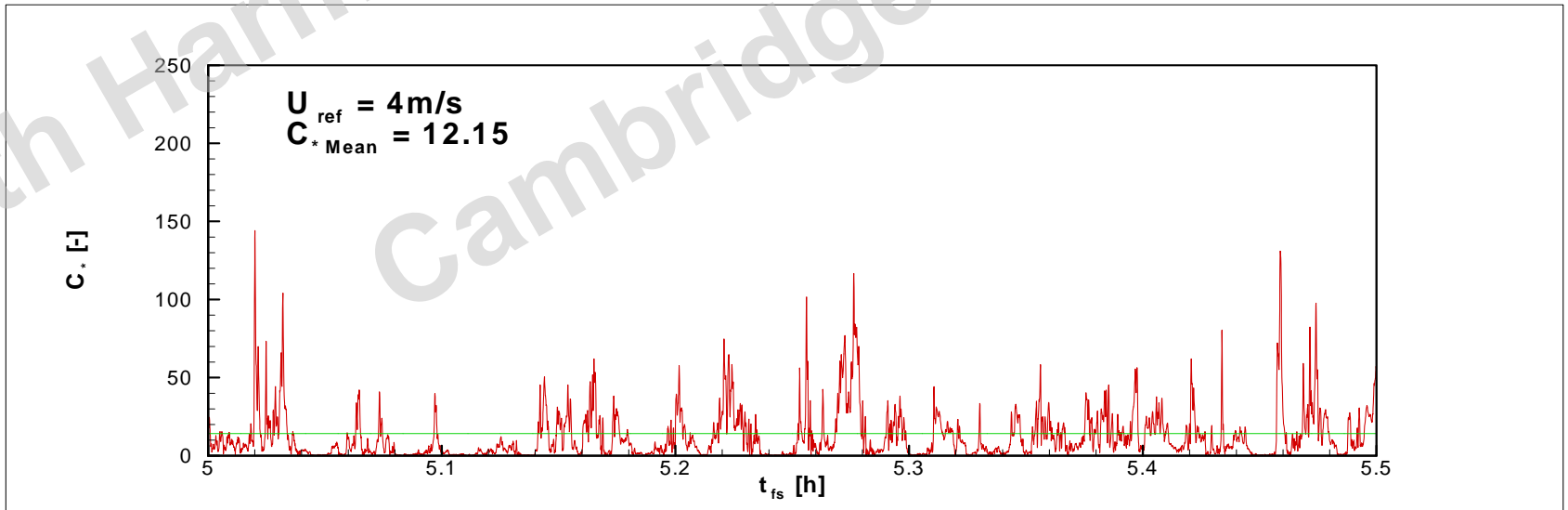
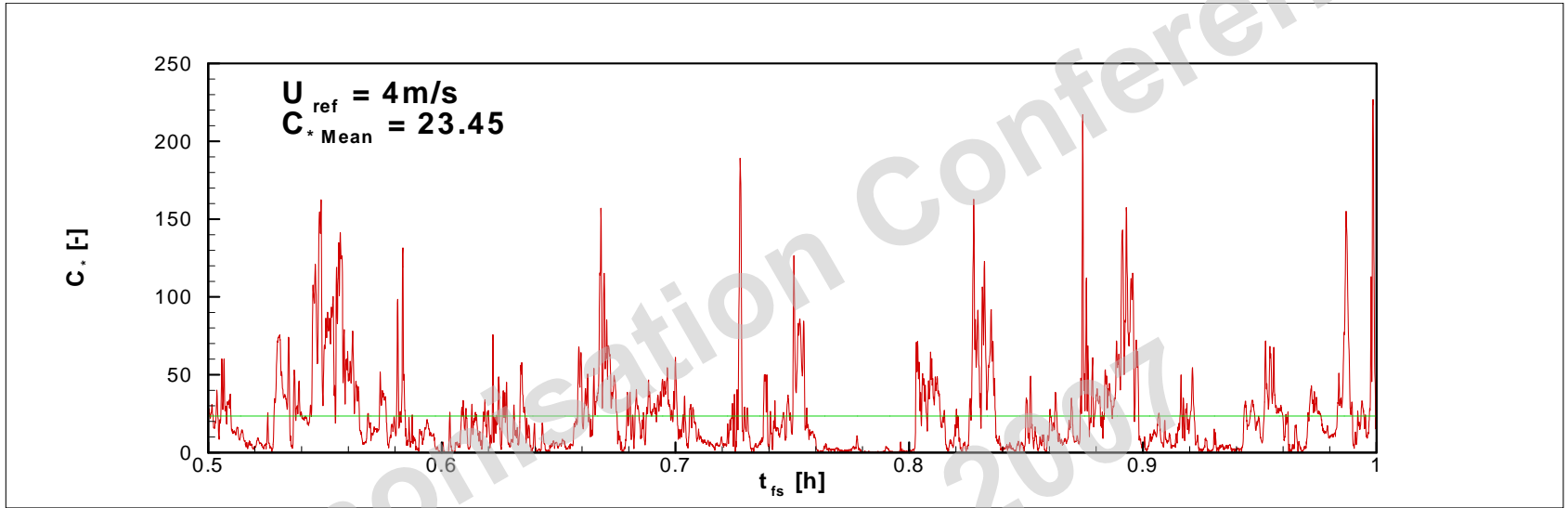




Street Canyon Goettinger Strasse in Hanover/Germany

Wind Tunnel Results: Concentration Time Series at the same Position

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CONCLUSIONS

- **Models are increasingly used**
- **Important decisions are based on modelled results**
- **Lack of confidence in modelled results**
- **A generally accepted quality assurance procedure is needed**
- **Consensus on validation data is needed**

Objective of COST action 732

- The main objective of the Action is to improve and assure the quality of micro-scale meteorological models that are applied for predicting flow and transport processes in urban or industrial environments.

How will the objective be met ?

- **Development of a coherent and structured evaluation procedure**
- **Provision of appropriate validation data**
- **Proof of serviceability of the procedure**
- **Consensus building within the scientific community**

What has been done so far ?

STATE OF THE ART:

- **ESF/COST Exploratory Workshop Hamburg 2005**
Quality assurance of microscale meteorological models

DOCUMENTS:

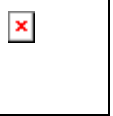
- **Background and Justification Document to Support the Model Evaluation Guidance and Protocol**
- **Model Evaluation Guidance and Protocol Document**
- **Best practice guideline for the CFD simulation of flows in the urban environment**



Where do you get more detailed information ?

**SPECIAL COST 732 SESSION
AT HARMO 11:
TODAY at 2 pm**

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SPECIAL COST 732 SESSION

- Michael Schatzmann: Welcome to the participants 5 min
- Rex Britter: Evaluation guidance and protocol 15 min
- Bertrand Carissimo: Best practice guideline 15 min
- Bernd Leitl: Validation data 15 min
- Silvana di Sabatino: MUST exercise 15 min
- General discussion: 45 min
- Michael Schatzmann: Summary and future plans 5 min

