

European Network on New Sensing Technologies for Air Pollution Control and Environmental Sustainability - *EuNetAir*

COST Action TD1105

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Influence of the Meteorological Conditions on Air Pollution in the City of Skopje

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Function: WG3 Member and MC Member
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 **cost**
EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY



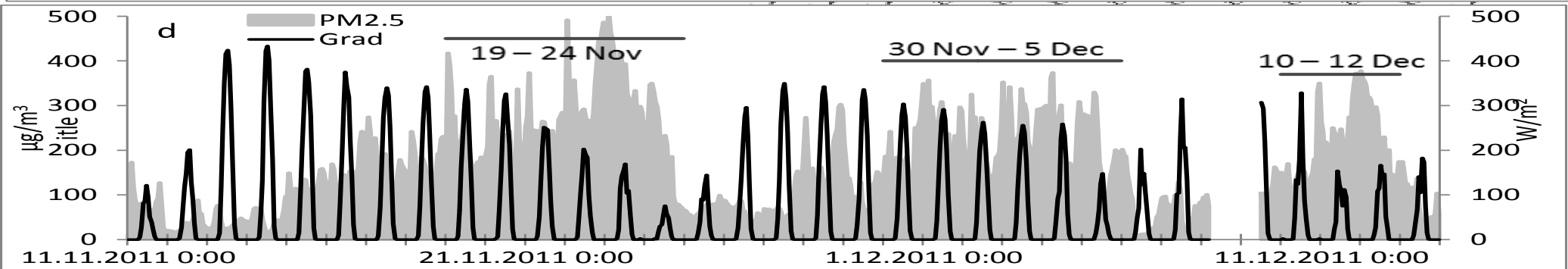
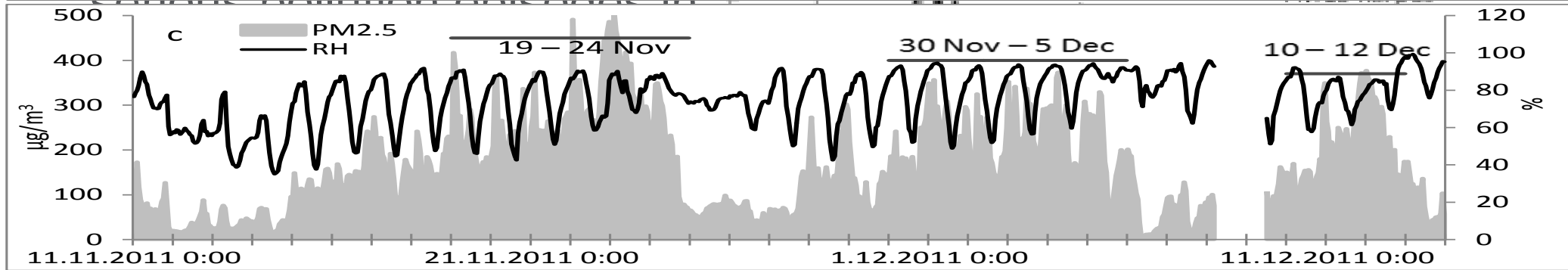
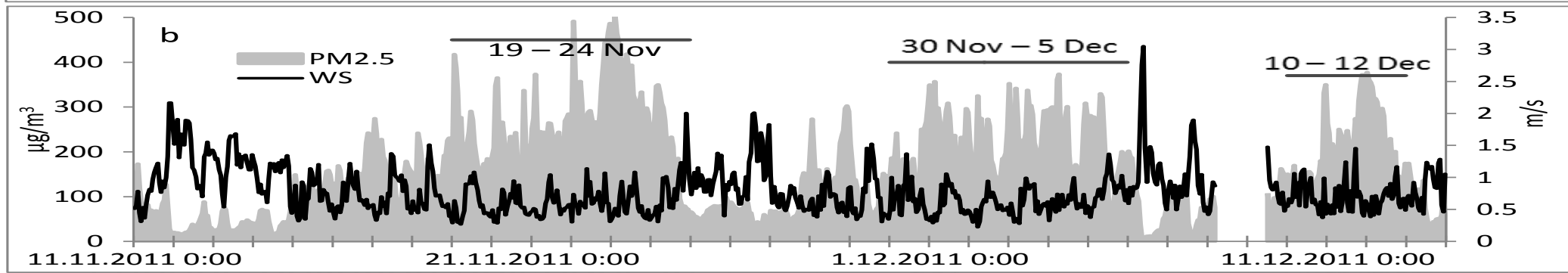
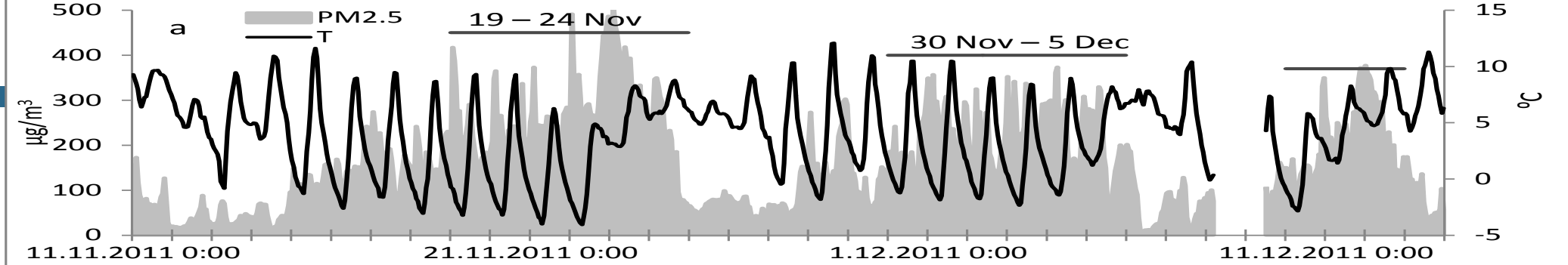


Scientific context and objectives

- The city of Skopje, the capital of the Republic of Macedonia is one of these valley based inland cities that are vulnerable to serious winter time pollution PM episodes;
- The aim of the study was to investigate relations between meteorological conditions and PM pollution on one urban background and one urban traffic station in city of Skopje;
- **PM10 and PM2.5 measurements in connection with WG3: Environmental Measurements and Air-Pollution Modeling**

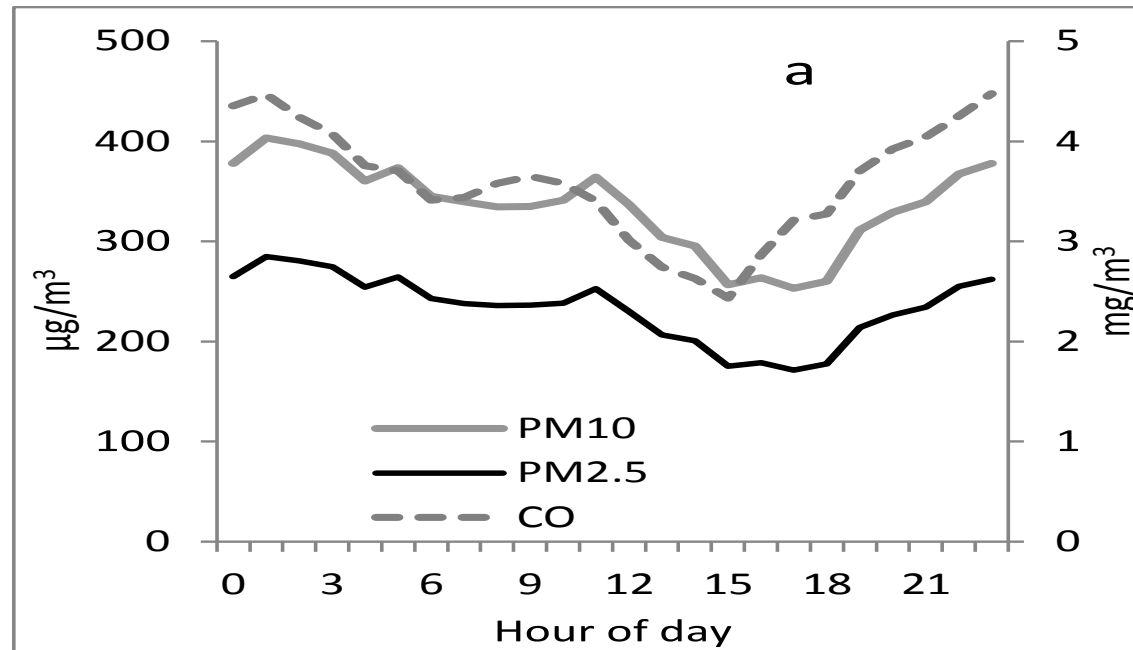
Current research activities-Methods and results

		Method	Instrument			Coverage %	
PM ₁₀		light scattering nephelometry and beta	Thermo Fisher Scientific, 5030 SHARP PM ₁₀			91	96
	Station	Annual mean PM10	Annual mean PM2.5	Max hourly mean PM10	Max hourly mean PM2.5	97	
PM _{2.5}	Centar [µg/m ³]	85	56	800	810		
temperat global ra relative humidity, pressure, wind speed and wind direction	Karpos[µg/m ³]	75	55	500	570		



PM10 and PM2.5 episodes

- Episode periods the maximum concentrations of PM occurred around midnight (Fig. 6a),
- Enhanced accumulation of the evening-time surface level emissions



Research Facilities-Monitoring station

- Air quality monitoring station Centar (41°59'33"N, 21°25'25"E, 250 m a.s.l.)
- 15 m to the north-west from a busy road with more than 10 000 vehicles per day
- major intersection on the north-eastern side at a distance of 100 m.
- four floor apartment building on one side and several smaller commercial and residential buildings
- Clinical Centre located 560 m of the station.



Research Facilities – Monitoring station

- Karpos station (42°0'24"N, 21°23'13"E, 260 m a.s.l.)
- In urban residential area in the western part of Skopje
- roads are 20–120 m away and major boulevards are located approximately 250 m away.
- several high-rise residential buildings (from 3 to 10 floors).
- Heavy fuel oil fired District Heat Production Plant –West is located 700 m north-west from the station (gasified in December 2013)



Suggested **R&I Needs** for future research

- Research on the episode days with high atmospheric stability prevailed and influence of meteorological condition in other cities inside a valley;
- Gathering, verification and validation of meteorological data;
- Installment and training for use of Chemical balance model;
- Source apportionment analysis for city of Skopje in order to define the participation of different sources including the influence of the meteorology;
- Use of Advanced Meteorological Mast in PM episodes prediction;
- All activities envisaged in next **Twining project** “*Further strengthening the capacities for effective implementation of the acquisition in the field of air quality*”



Thank you for your attention

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