

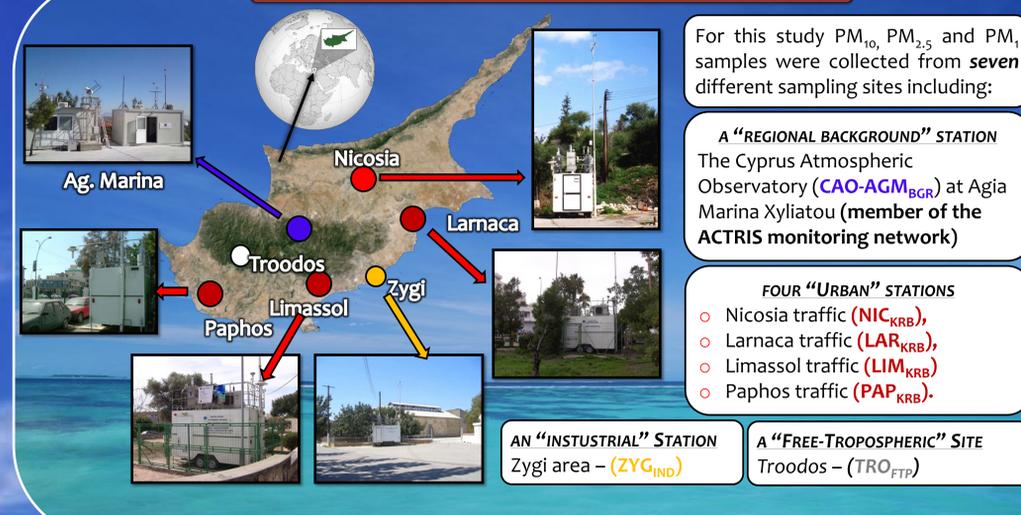
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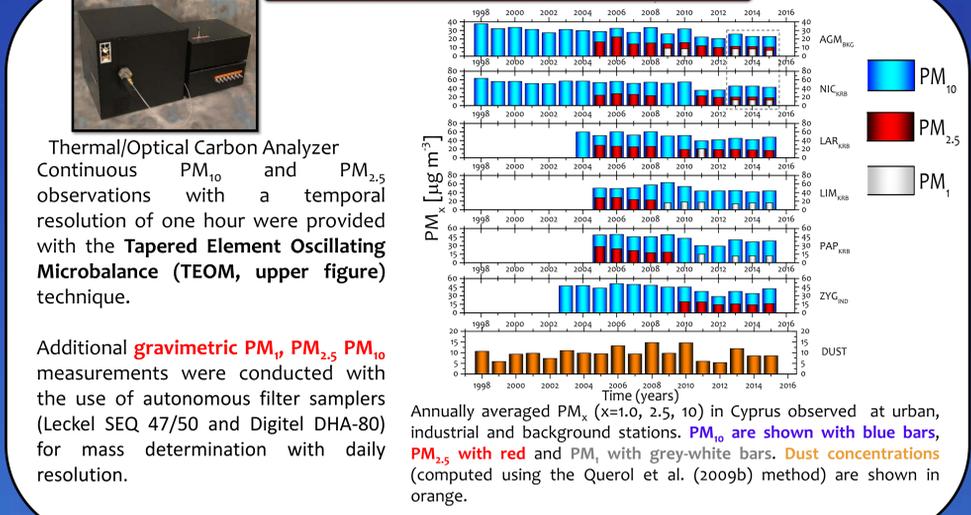
## ABSTRACT

This study presents novel information on the **spatial and temporal variability** of sub-10µm (PM<sub>10</sub>), fine (PM<sub>2.5</sub>) and submicron (PM<sub>1</sub>) particulate matter fractions in Cyprus based on measurements performed at **urban, industrial** and **background** environments. Notably, the multiannual (1998-2015) PM<sub>10</sub> average of 28.7±5.0 µg m<sup>-3</sup> observed at the regional background site **Cyprus Atmospheric Observatory (CAO or AGM<sub>BGR</sub>)** in Cyprus, is higher than the majority of rural sites in central and northern Europe and the west Mediterranean basin. CAO is a member of the **ACTRIS** (European Research Infrastructure for the observation of Aerosol, Clouds, and Trace gases) and the **EMEP** (European Monitoring and Evaluation Programme) networks. **Our data show that dust emanating from regional transport from eastern Asia and Northern Africa is responsible for a significant part, equal to 33.6±5.2% (or about 10 µg m<sup>-3</sup>) of the annual PM<sub>10</sub> reported values.** At CAO, significant decreasing trends of 0.7 µg m<sup>-3</sup> y<sup>-1</sup> have been observed for the PM<sub>10</sub> (1998-2015) and PM<sub>2.5</sub> (2006-2015) fractions indicating contribution from both natural and anthropogenic sources to this tendency. **On average, around 40% of the observed PM<sub>10</sub> levels at the urban and industrial locations is estimated to originate from local anthropogenic and/or natural emissions.** These localized emissions are almost equally distributed in the fine and coarse fractions. The above results highlight significant emissions from both fine mode (e.g. residential heating and traffic) and coarse mode urban emissions (e.g. dust resuspension, wear and tear in brakes and tires, respectively) in urban and industrial locations in Cyprus.

## LOCATION OF MEASUREMENTS

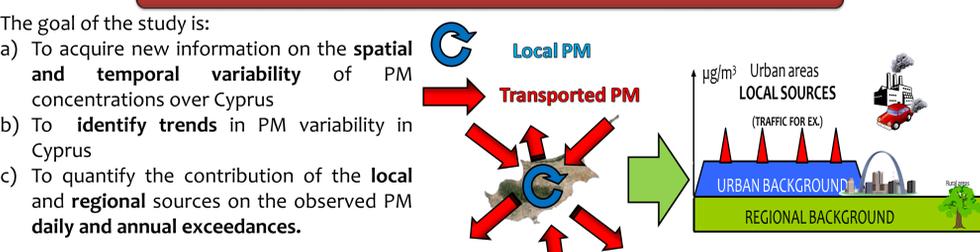


## METHODS AND DATA SERIES

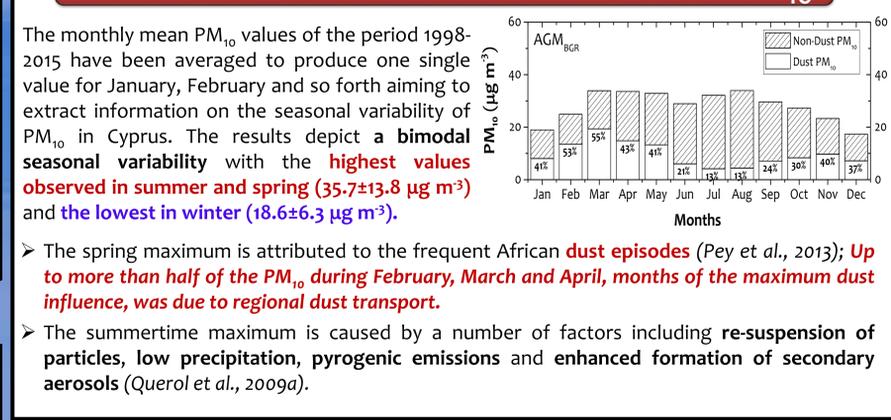


## RESULTS

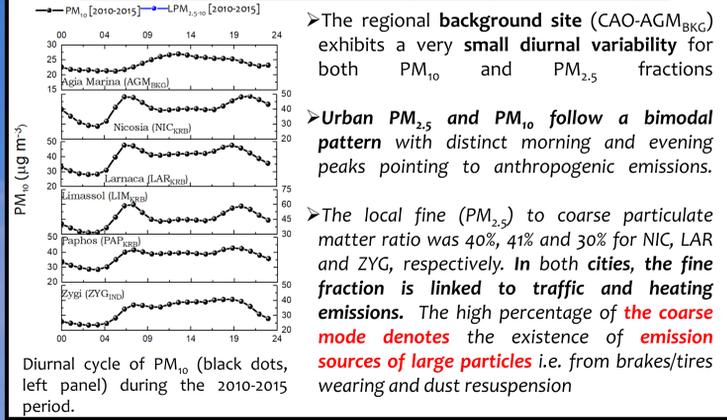
### GOAL OF THE STUDY



### SEASONAL BACKGROUND VARIABILITY OF PM<sub>10</sub>



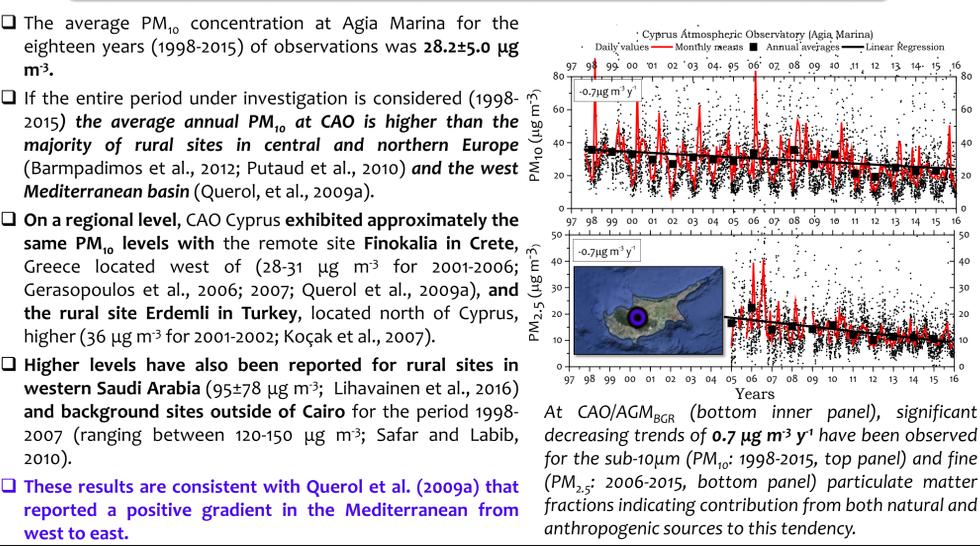
### DIEL VARIABILITY OF PM IN CYPRUS



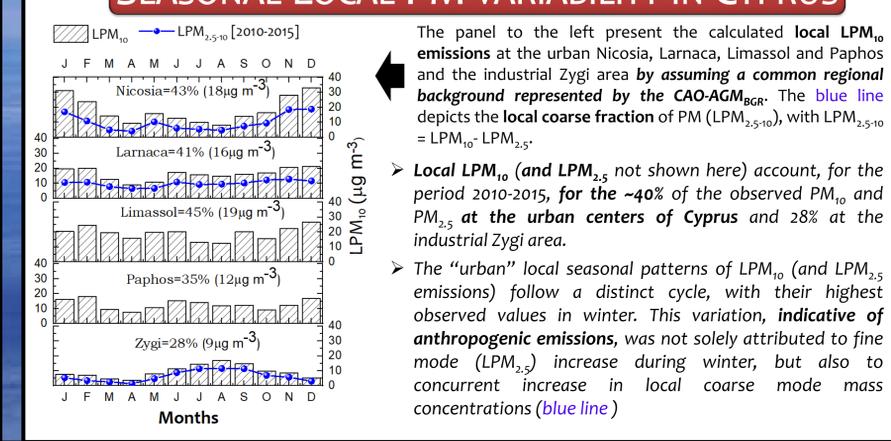
### CONCLUSIONS

- High but decreasing PM<sub>10</sub> and PM<sub>2.5</sub> concentrations
- Remote Cyprus: Strongly influenced by transported dust; Small diurnal PM variability
- Urban Cyprus: Bimodal seasonal and diurnal PM patterns due to anthropogenic emissions; 40% of the observed PM<sub>10</sub> levels is estimated to emanate from local anthropogenic and/or natural emissions; Locally, ~60% of the particles are found in coarse mode

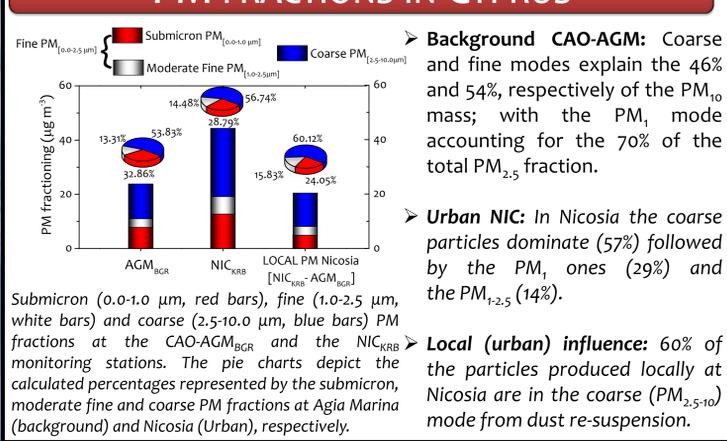
### BACKGROUND PM CONCENTRATIONS AND TRENDS



### SEASONAL LOCAL PM VARIABILITY IN CYPRUS



### PM FRACTIONS IN CYPRUS



### BIBLIOGRAPHY

The findings of this study, as well as all cited references, are presented at: Pikridas, M., Vrekoussis, M., Sciare, J., Kleanthous, S., Vasiliadou, E., Kizas, C., Savvides, C., and Mihalopoulos, N.: Spatial and temporal (short and long-term) variability of submicron, fine and sub-10 µm particulate matter (PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>) in Cyprus, *Atm. Env.* 191, 79-93, 2018.

### ACKNOWLEDGMENTS

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