



# Saharan dust episodes in urban aerosol in Croatia

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## Introduction

The influence of Saharan dust on coarse fraction levels at measurement sites settled in three industrial cities is analyzed.

## Data and methods

Analyzed period: May – August 2007 & September – October 2008

### Identification and tracking of Saharan dust episodes:

1. UV aerosol index (AI),  $AI \geq 0.7$  at all sites
2. lat – lon maps of AI

### Aerosol index (AI)

- measure how much the wave-length dependence of backscattered UV radiation from an atmosphere containing aerosols differs from that of a pure molecular atmosphere
- instrument: OMI (Ozone Monitoring Instrument)
- satellite: Aura
- AI resolution:  $1^\circ \times 1^\circ$  in latitude
- download of AI data: <http://toms.gsfc.nasa.gov>

### Measurement sites and data

3 sites in 3 industrial cities  
Sites are part of Croatians National Air Quality Monitoring Network  
PM10 data, gravimetric analysis



N: 45° 20' ; E: 14° 27'



N: 45° 48' ; E: 16° 56'

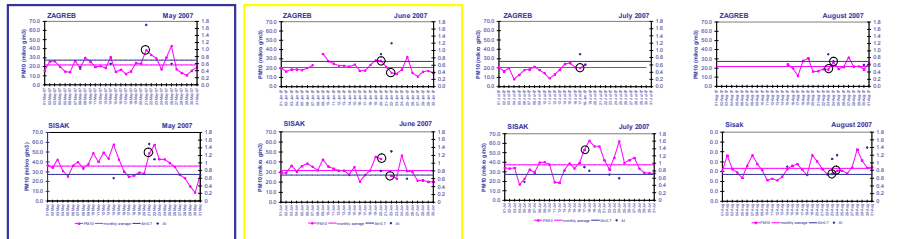


N: 45° 20' ; E: 16° 16'

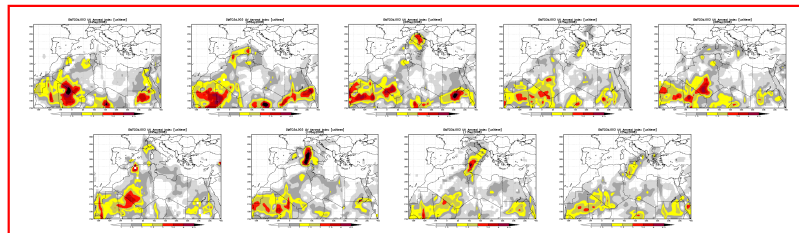
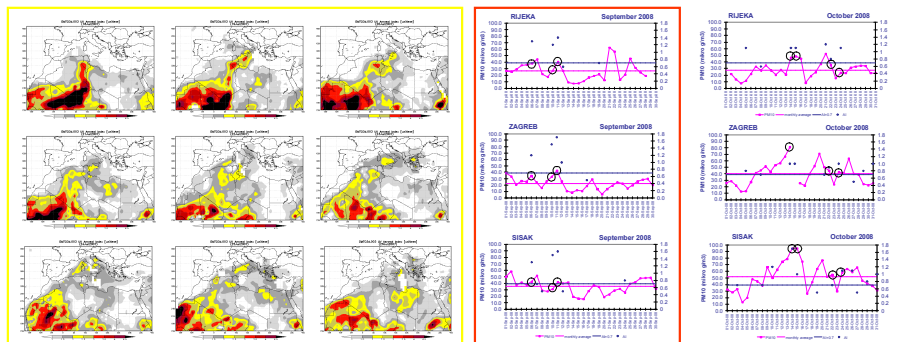
## Conclusions

Despite the current limitations in analysis due to using data from 3 locations and uncertainties due to limitation in the availability of PM10 measurements, this work gives important information about the contribution of Saharan dust to PM10 levels in urban areas in Croatia.

## Results



○ Saharan dust episode when all sites have  $AI \geq 0.7$



## EUMETSAT Dust RGB product and Saharan dust episodes over Croatia

### Motivation

To investigate the use of EUMETSAT Dust RGB product for identification and tracking of the Saharan dust episodes over Croatia, since EUMETSAT products are present in the operational forecast

### Method

The concept of RGB (red-green-blue) composites is to combine the information of three different satellite channels or channel combinations, marking each part in one of the three colors: red, green and blue. The Dust RGB enables the discrimination between clouds and dust particles.

Dust RGB implements the information provided by three different infra-red channels (12.0, 10.8 and 8.7  $\mu\text{m}$ ).

Dust is seen as pink colour in the RGB composite.

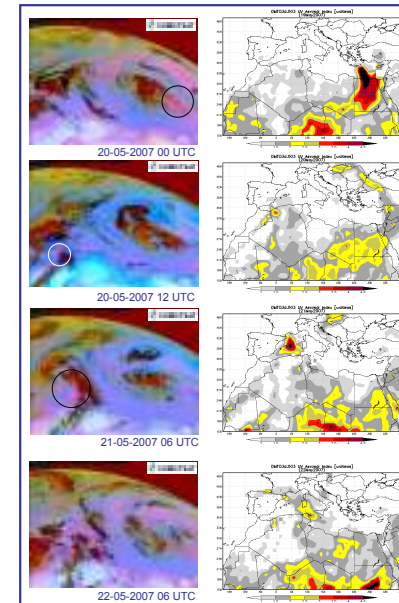
### Results

We analyzed 6 Saharan dust episodes over Croatia: 20-22 January 2004, 9-12 April 2005, 17-19 July 2005, 19-22 May 2007, 11-13 April 2008.

A common synoptic feature is a cyclone in the West or Central Mediterranean with a cold front passing over North Africa. Saharan sand is being lifted ahead of the cold front (cases 17-19 July 2005, 8-9 September 2005, 11-13 April 2008) or behind the cold front (cases 21-22 February 2004, 10 April 2004 and 19-22 May 2007).

In all cases (sand) is being advected by the strong south westerly upper-level flow on the leading side of deep upper-level trough.

The episode 19-22 May 2007 is presented here:



### Conclusions about using Dust RGB product

Dust RGBs offers the possibility to depict dust plumes over land and sea, during both day and night.

When the dust particles get covered by the cloud particles, they are no longer detectable from the satellite.

The sand is detectable only if the concentration of the dust particles is large enough → needs to be investigated which are critical values of the concentration.

### Acknowledgments

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