

# Investigating source and trends of atmospheric dust and urban pollution in central part of Iran using LiDAR, in situ recording and satellite data

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Climate change in the Mediterranean and the Middle East Challenges and Solutions

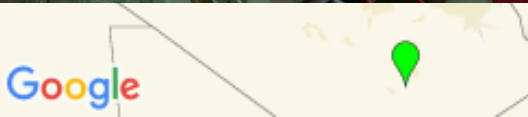
17 May 2018

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# ① Physics Department Remote Sensing Laboratory (PDRSL)

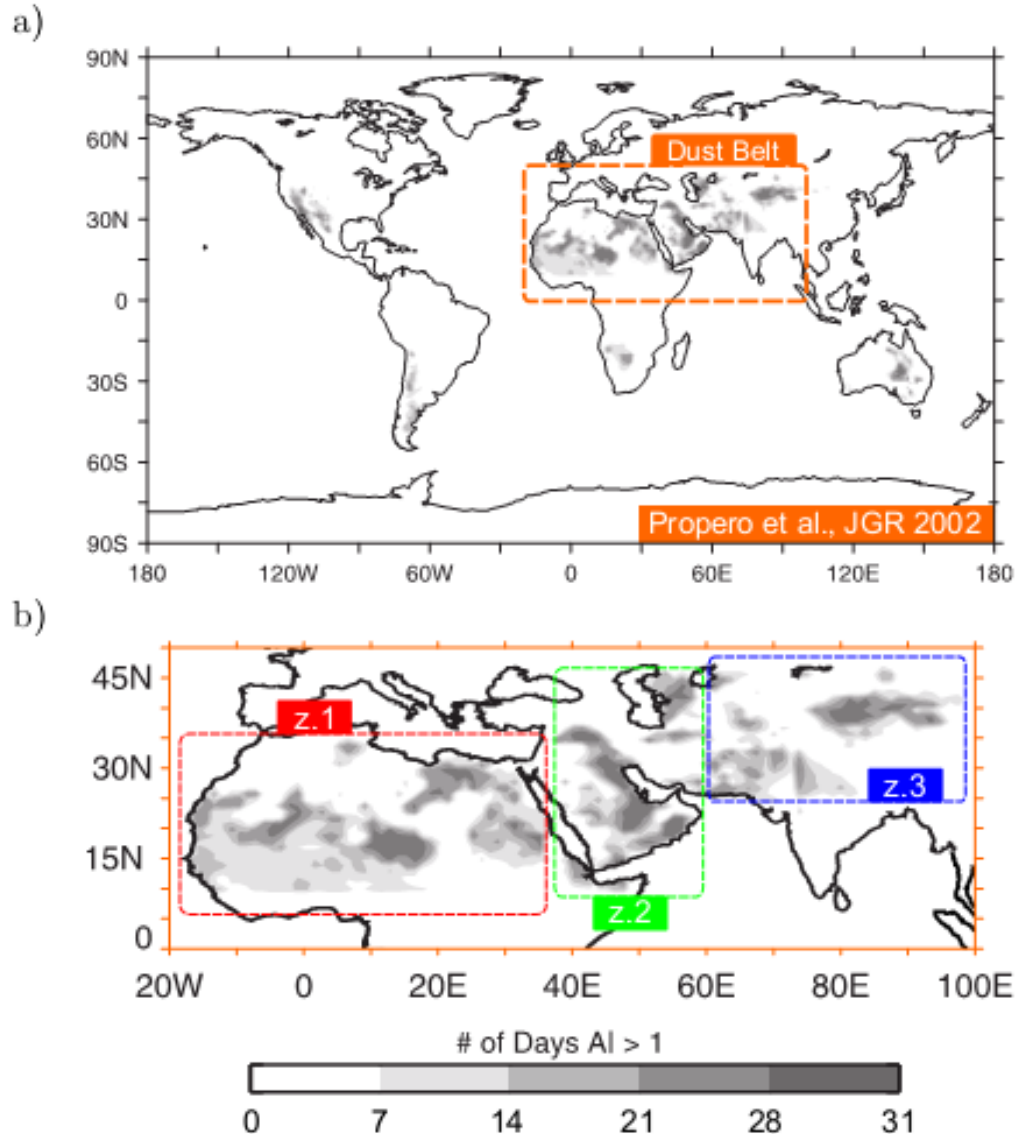
## 1-1 Stations



# 1 PDRSL

## 1-2 Objectives

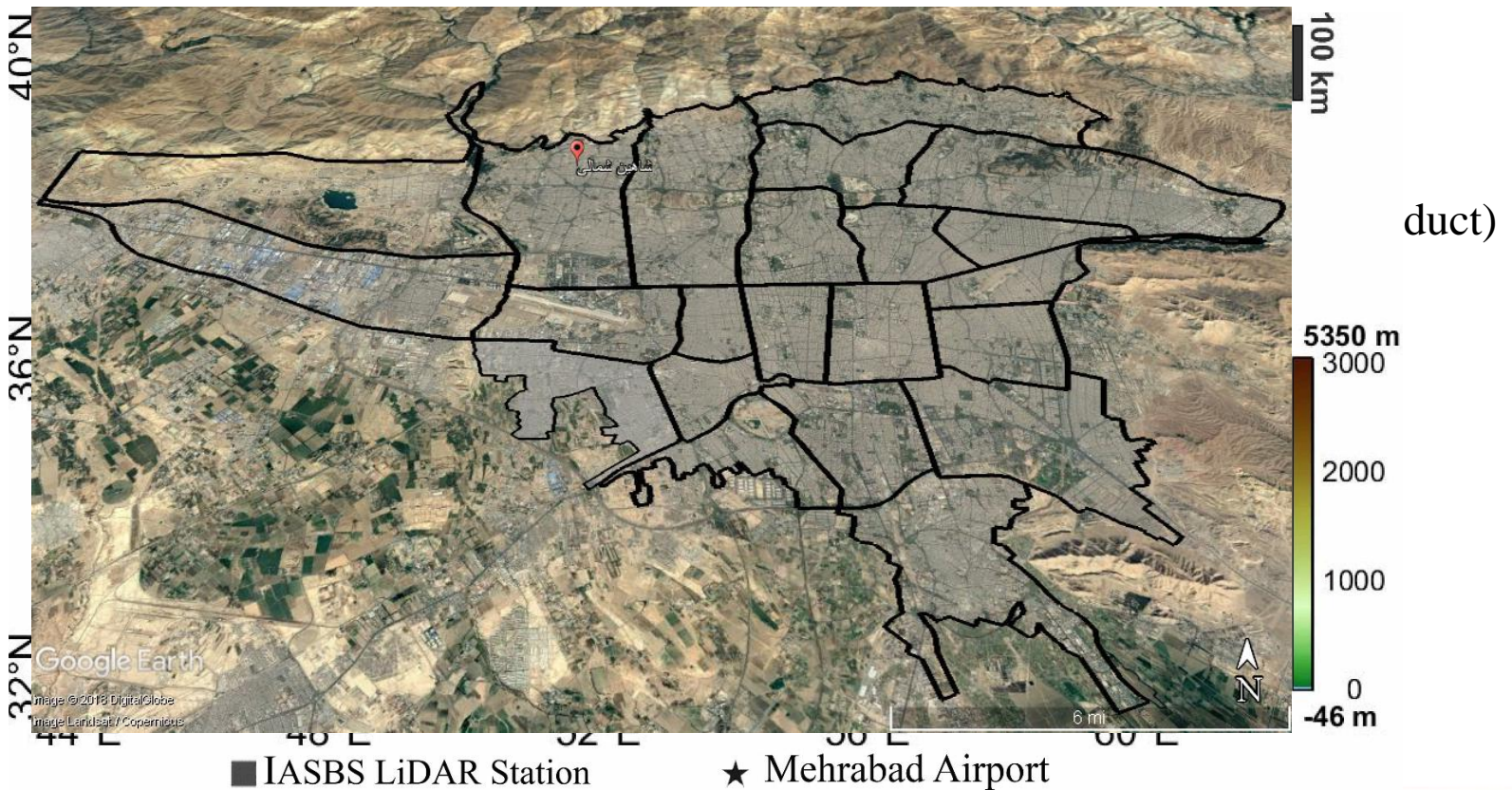
- Monitoring parts of Iran
- Determining factors affecting the
- Studying the
- Specifying the properties of type in this



## 2 PDRSL

### 2-3 Methods

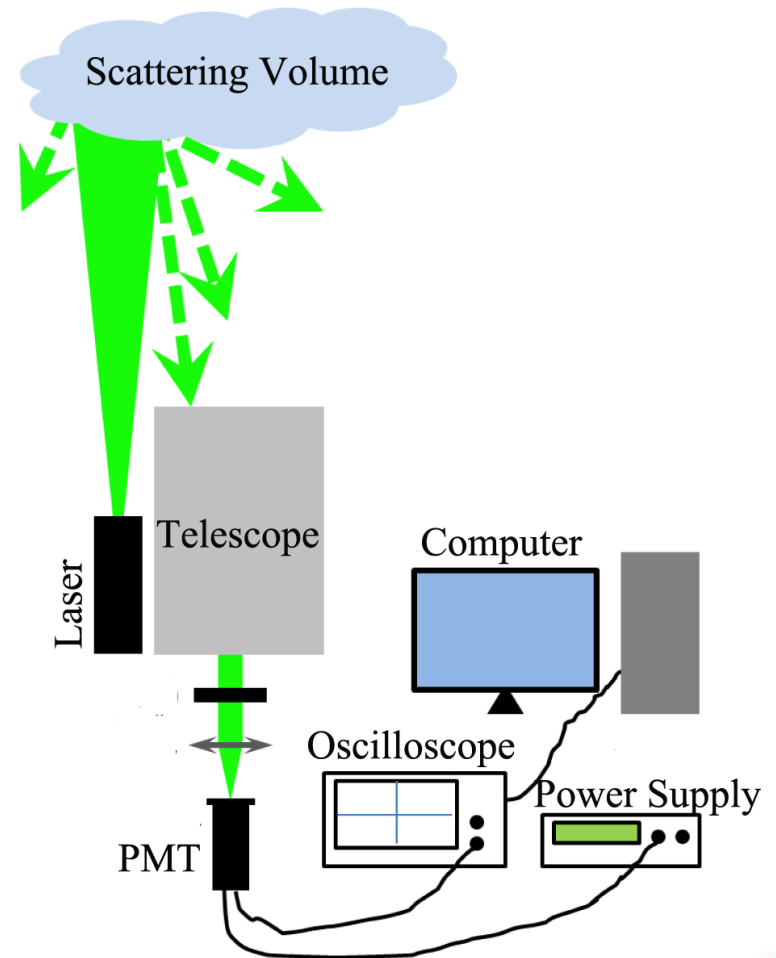
- Ground Base Measurements
- Lidar Station



## ② Lidar and Atmosphere

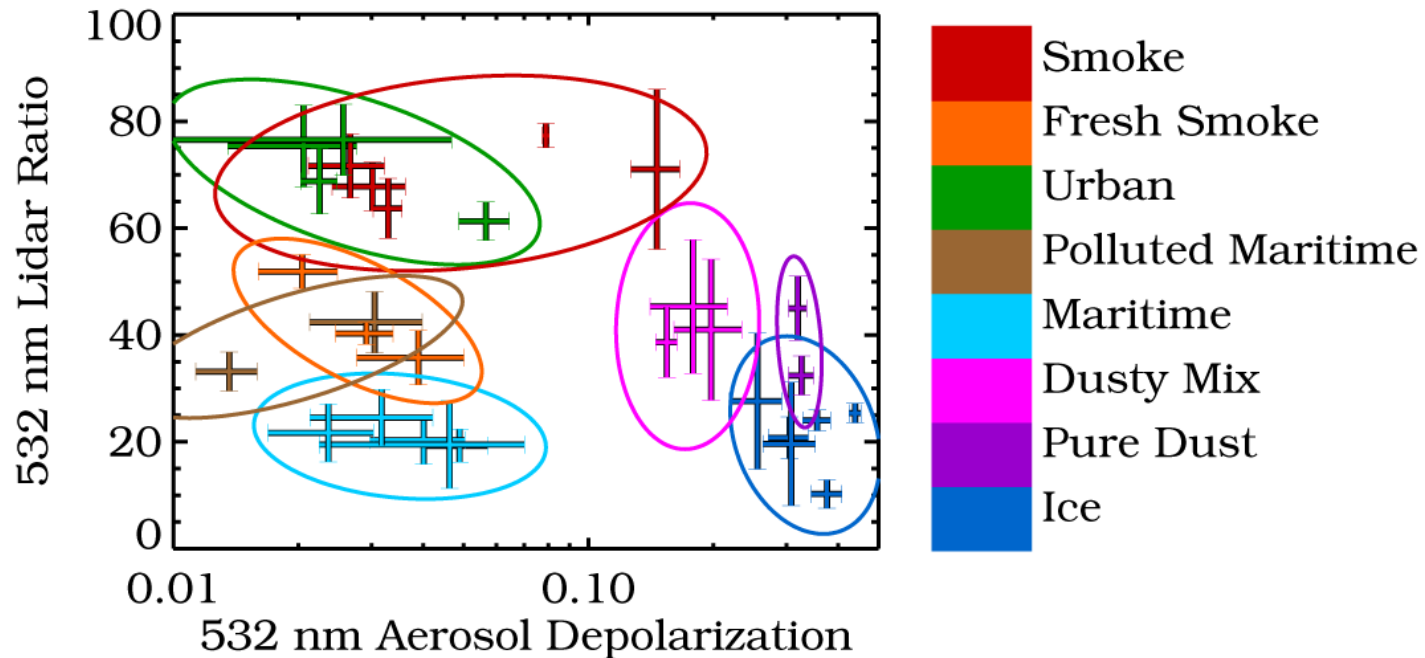
### 2-1 Remote Sensing Techniques

- $P(R) = K G(R) \beta(R) T(R)$



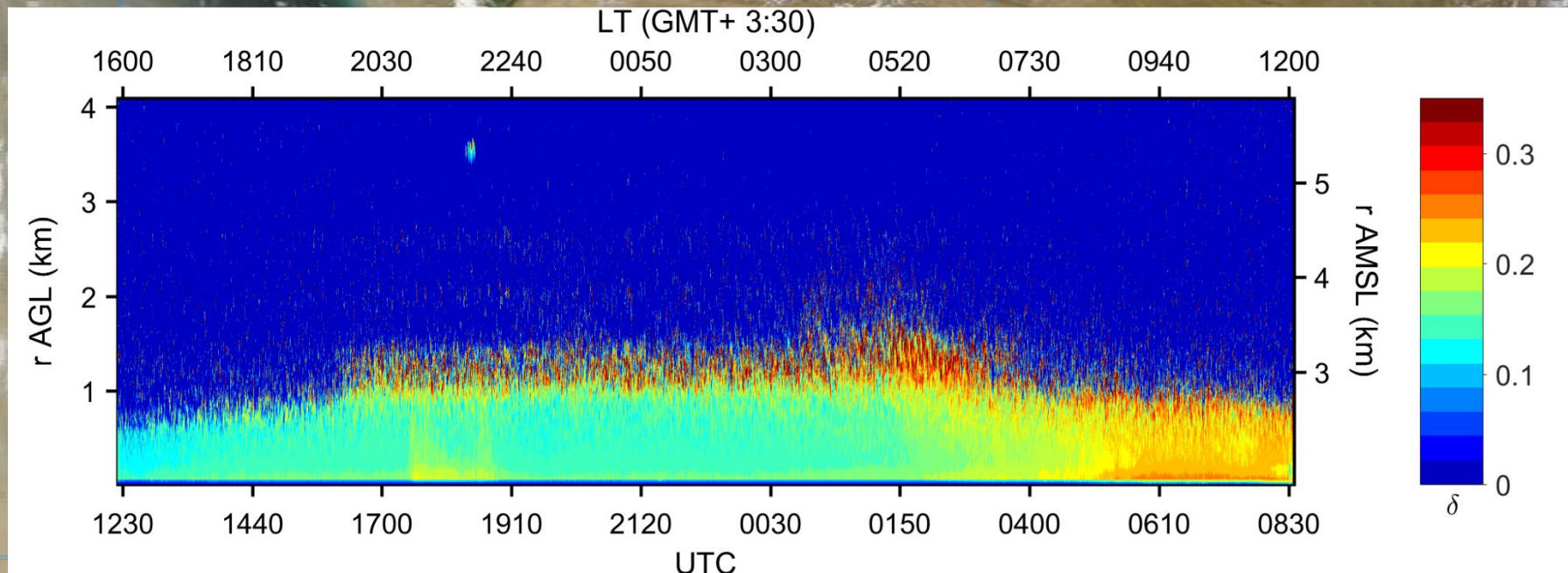
## 2 Lidar and Atmosphere

### 1-2 Aerosol Types



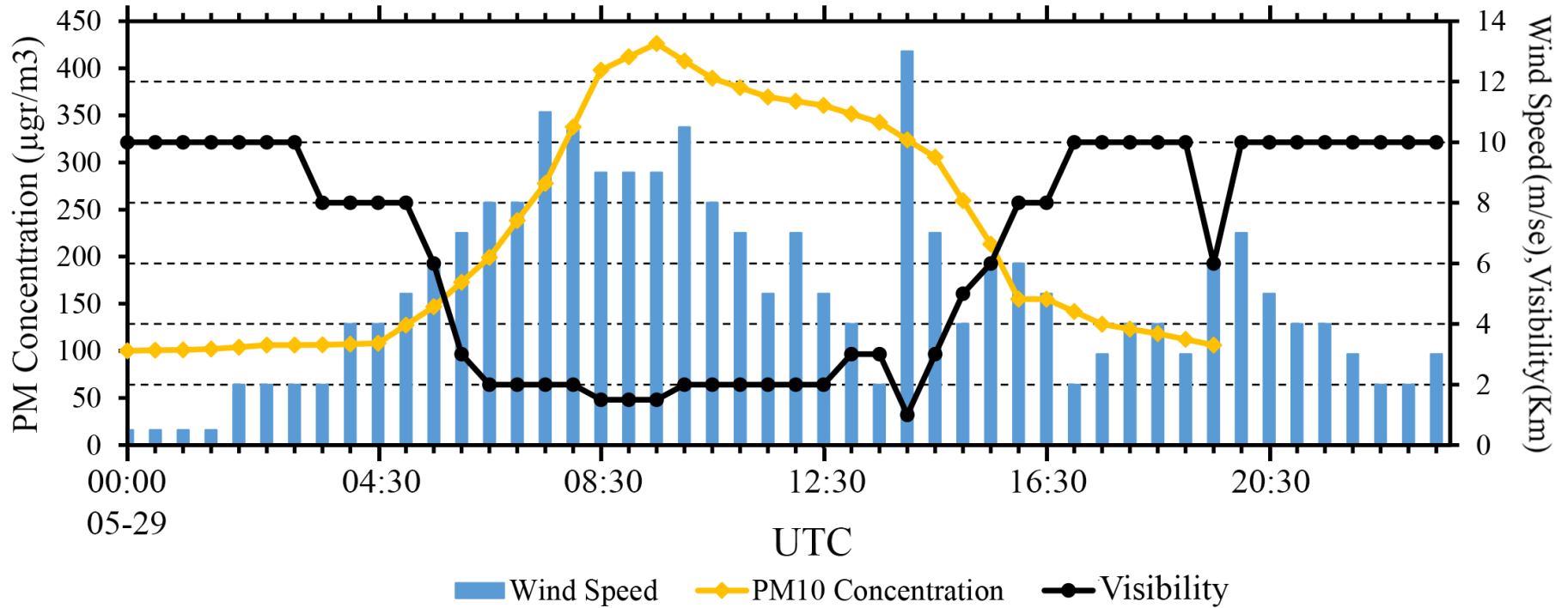


# 4 Case Studies



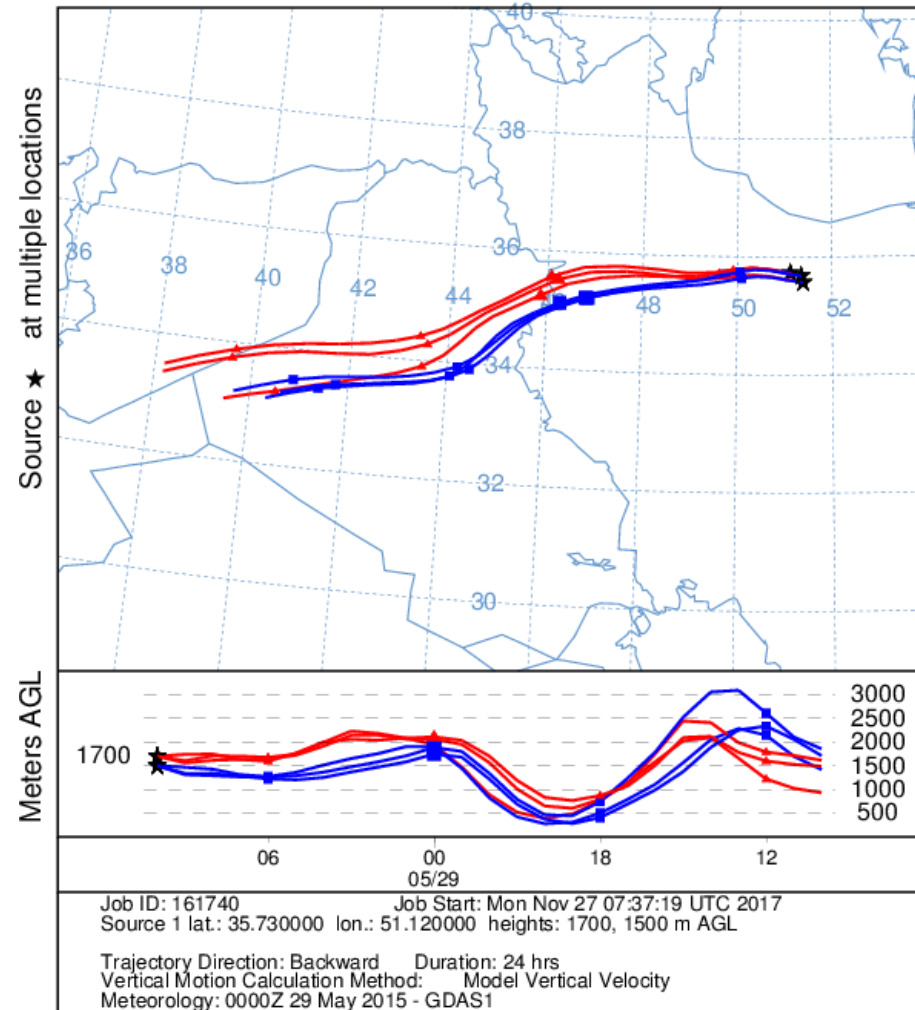
Depolarization signals @ 532 nm

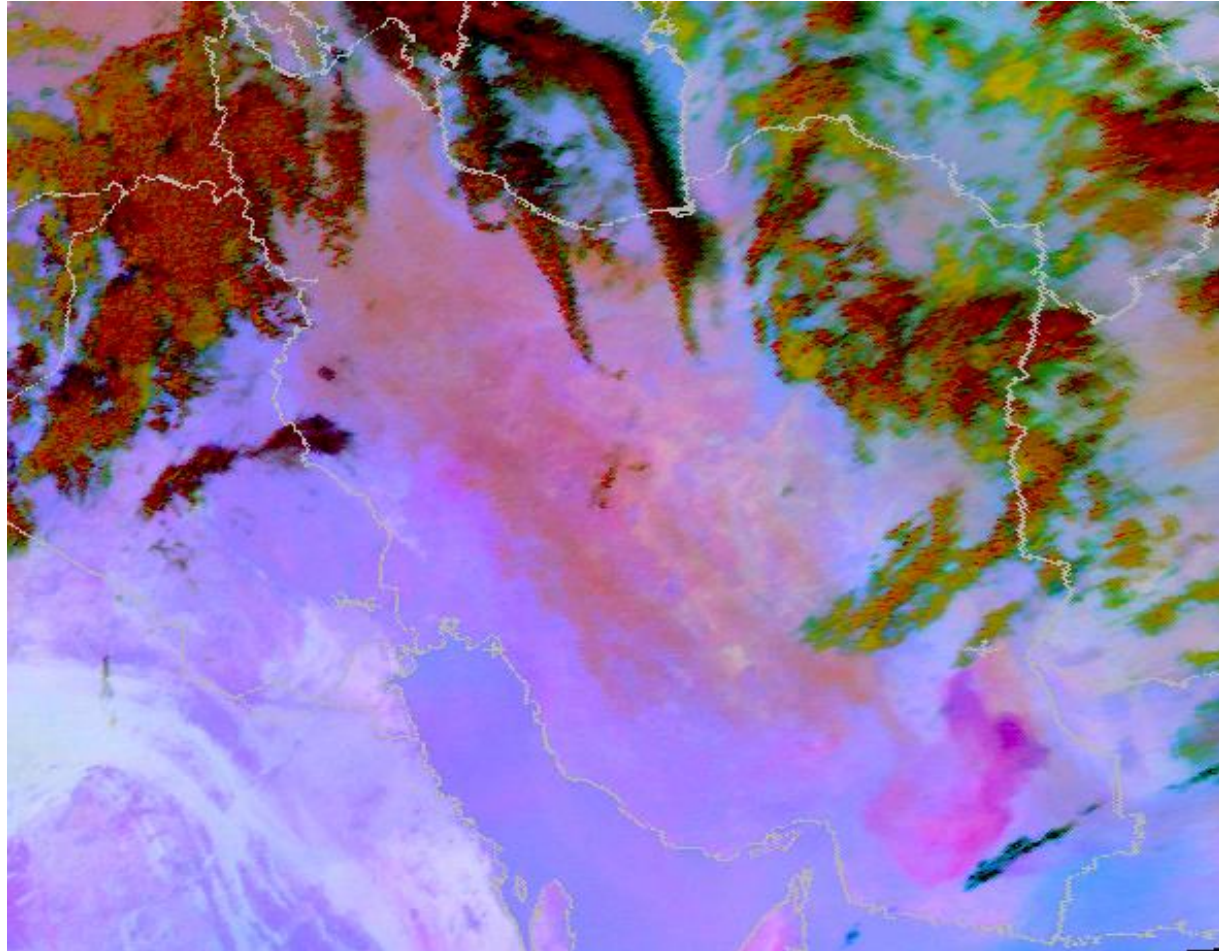
# 4 Case Studies



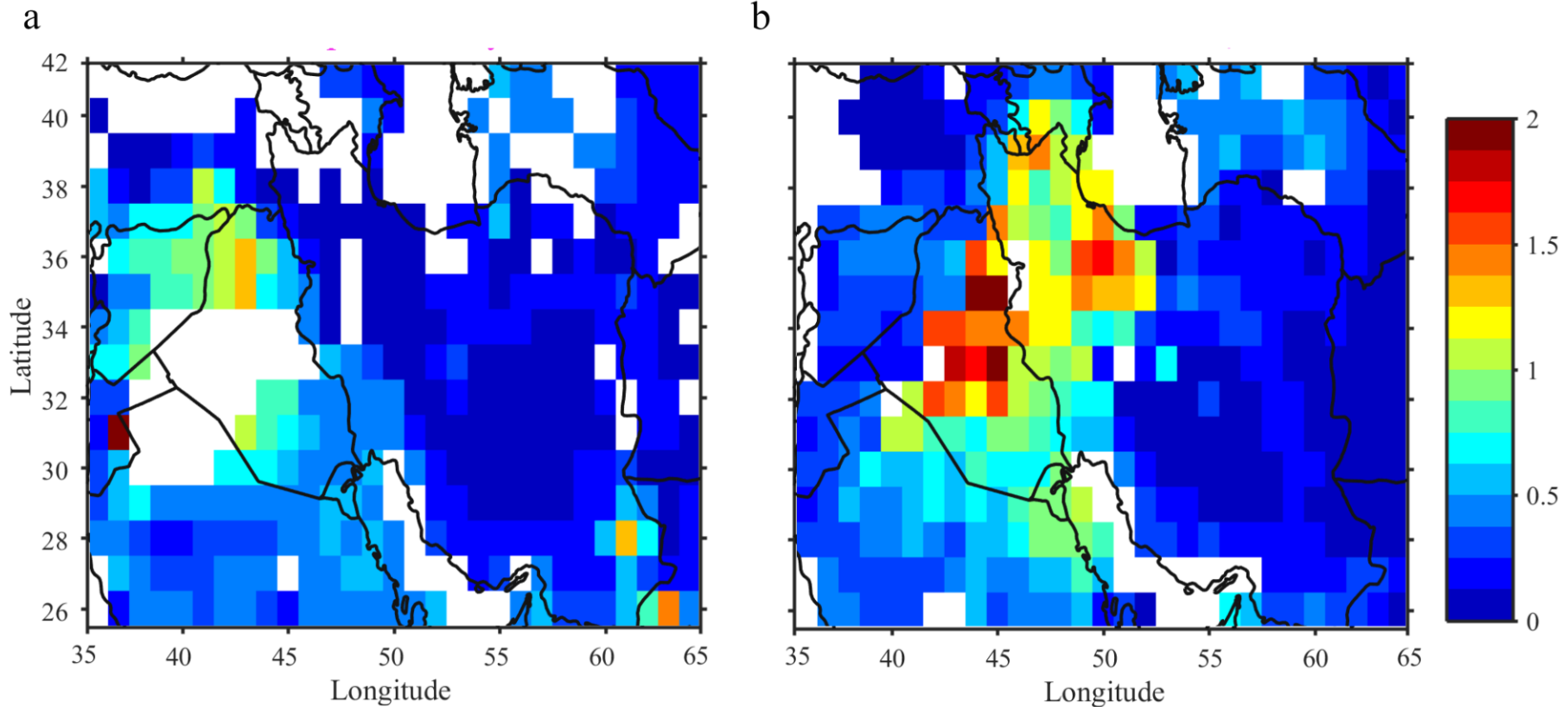
# 4 Case Studies

NOAA HYSPLIT MODEL  
Backward trajectories ending at 1000 UTC 29 May 15  
GDAS Meteorological Data





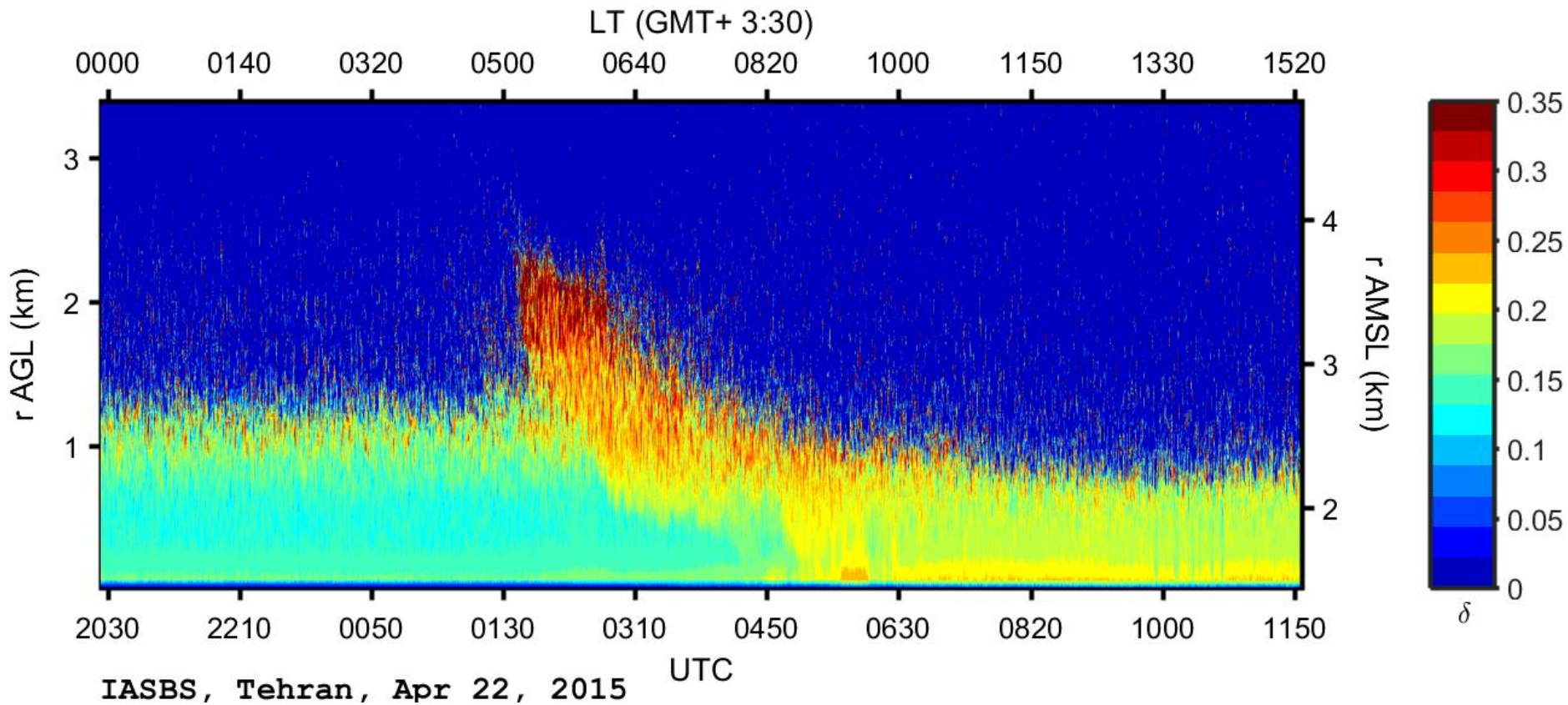
# 4 Case Studies



Modis AOD Deep blue a) 28 may 2015 b) 29 May 2015

## 4 Case Studies

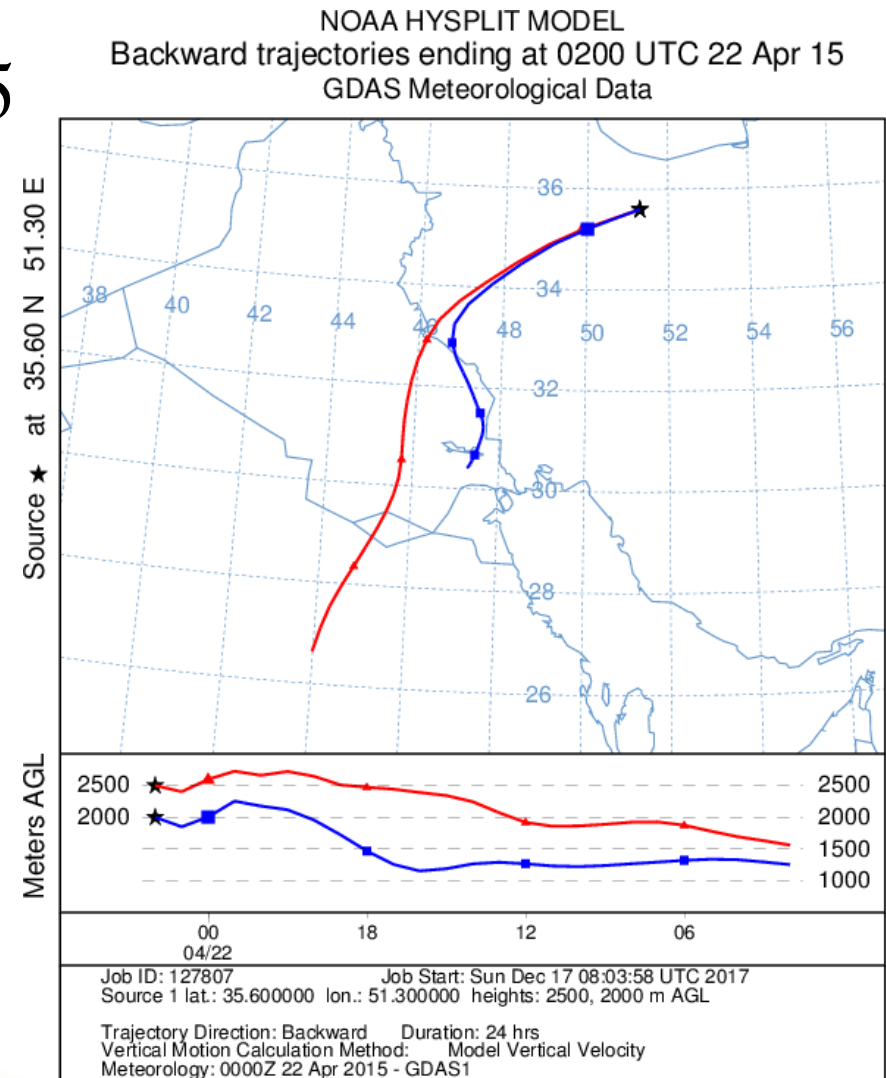
- Dust event 22 April 2015

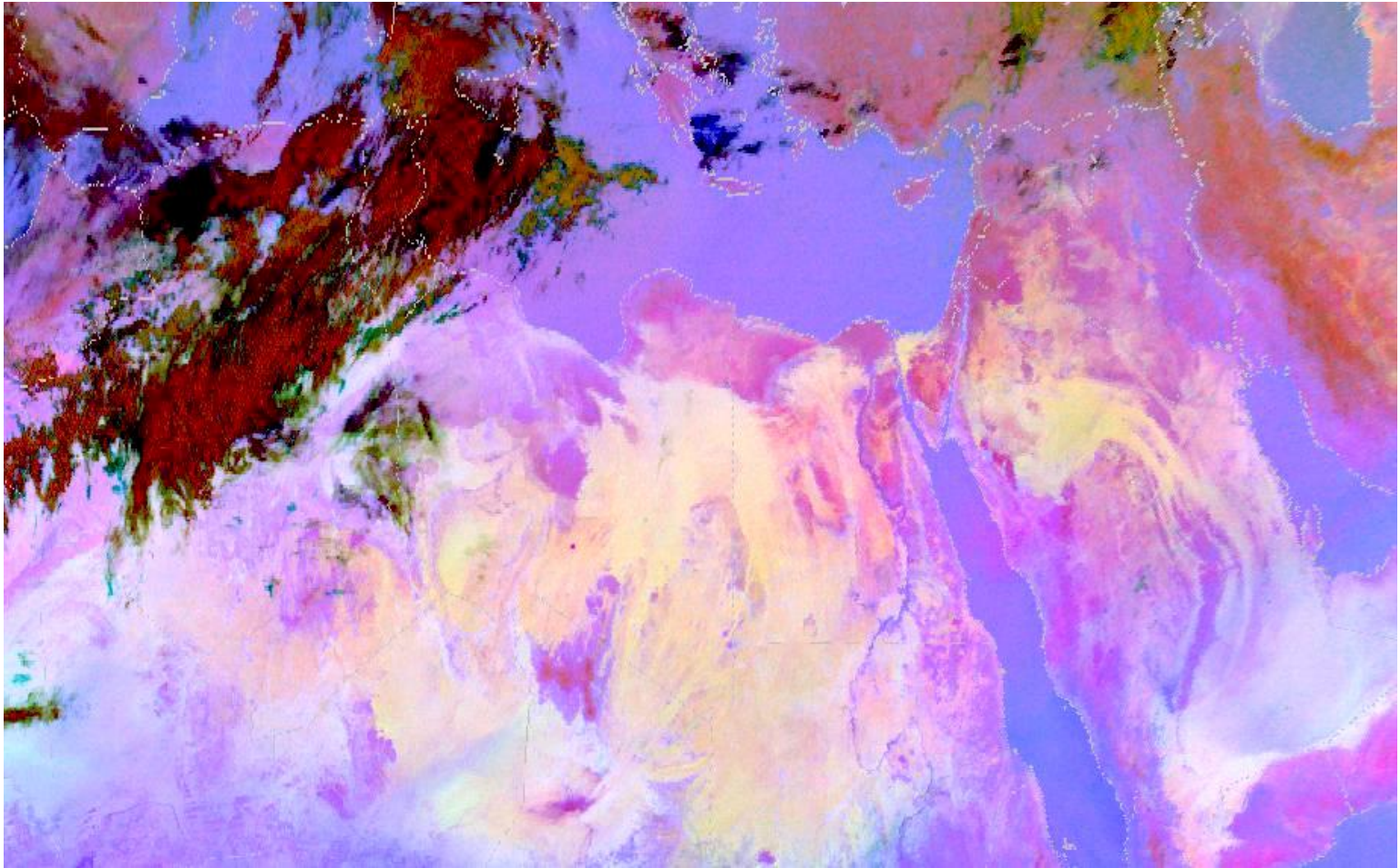


Depolarization Ratio

# 4 Case Studies

- Dust event 22 April 2015





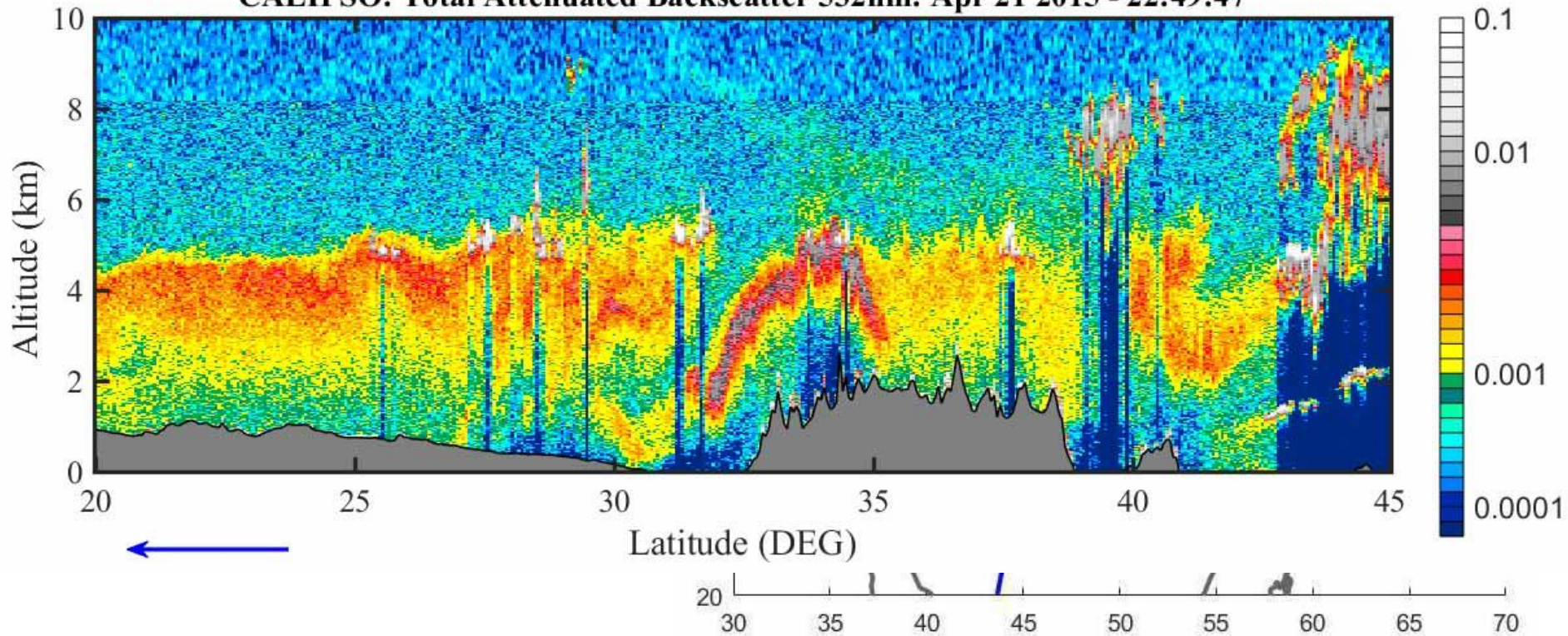


## ④ Case Studies

- Dust event 22 April 2015

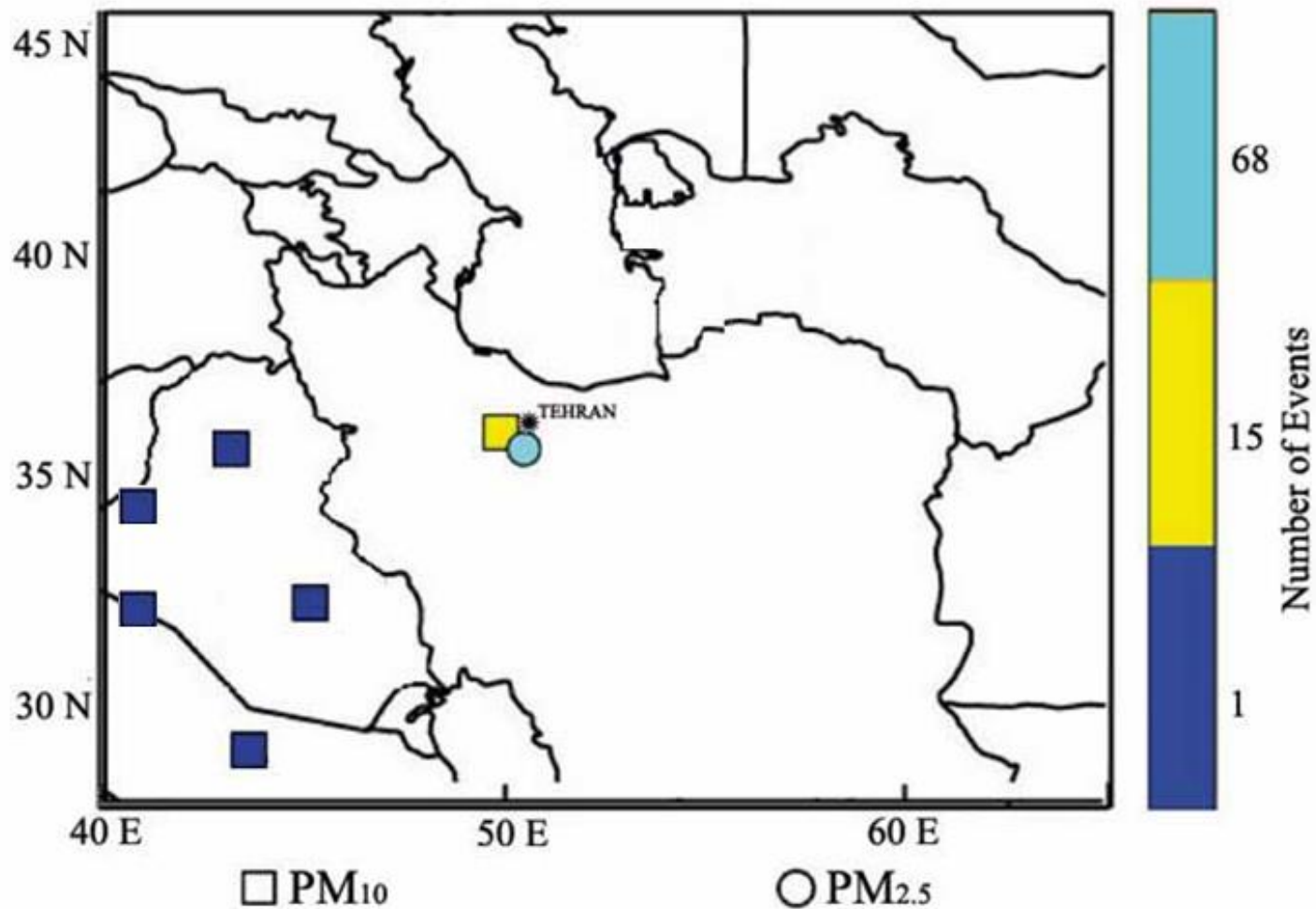
a

CALIPSO: Total Attenuated Backscatter 532nm: Apr 21 2015 - 22:49:47



# 5 Conclusion

## Sources of the events



## 5 Conclusion

- Iran plateau is located on the Earth dust belt and surrounded by intense dust sources.
- Both dust and anthropogenic particles are contaminating the observation site atmosphere.
- Most of the dust events are happening in late spring and summer times.
- The strength and frequency of dust storm increased in previous years.