ALADIN AT TURKISH STATE METEOROLOGICAL SERVICE

14th ALADIN General Assembly
12-13 November 2009, Istanbul

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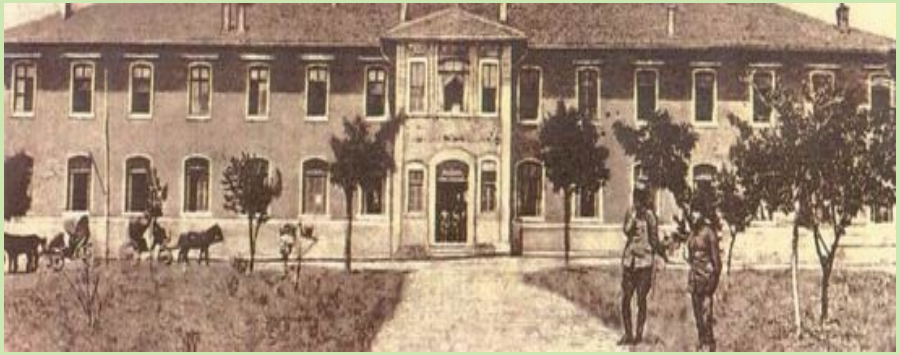
Introduction

Brief History



1839 The first meteorological observations in Istanbul
1873 Participated in the International Meteorological Congress (Vienna)
1875 First Observation Network established with 16 stations
1915 Upper air observations and weather forecasts started
1925 Establishment of Meteorological Institute
1938 Establishment of Turkish State Meteorological Service
Memberships to International Meteorological Organizations;
- WMO (1949)
- ECMWF (1975)
- EUMETSAT (1984)
- ECOMET (1999)

2008 Became member of ALADIN Consortium

Introduction

Recent Investments

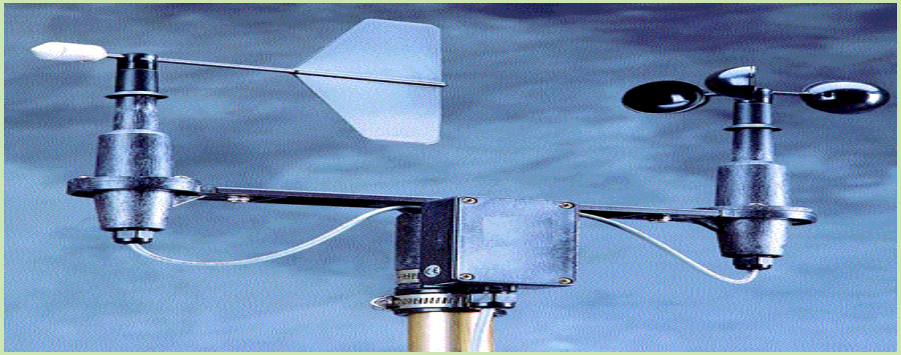
- **Year of 2008 is a starting point for meteorological investments. TSMS has been investing about €20 Million to its meteorological infrastructure during period of 2008-2012.**

- **The main components of the investments are additional 196 Automated Observation Systems, enlargement of Radar Network and new High Performance Computer System.**

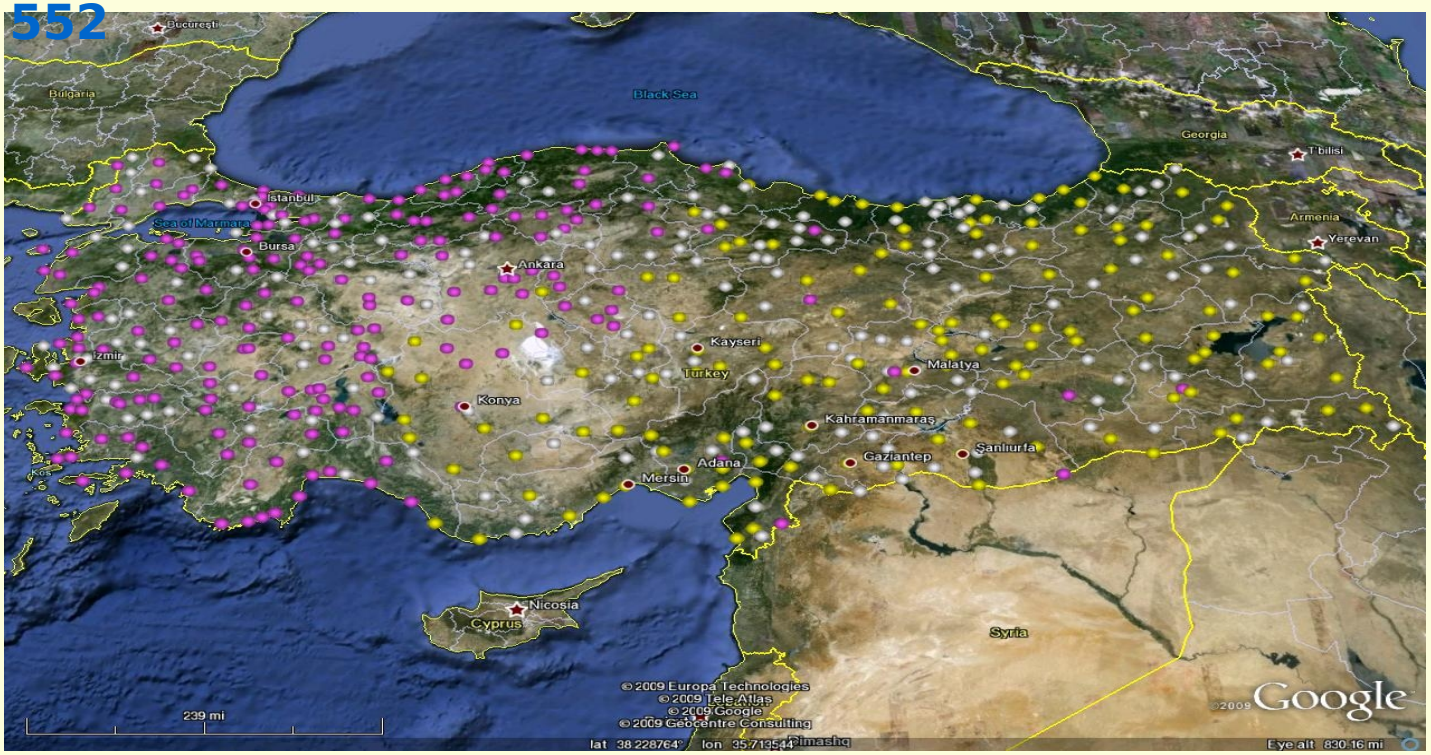
Introduction

Recent Investments

Automated Observation Systems



Total Number of Automated Observation Systems will reach to 552

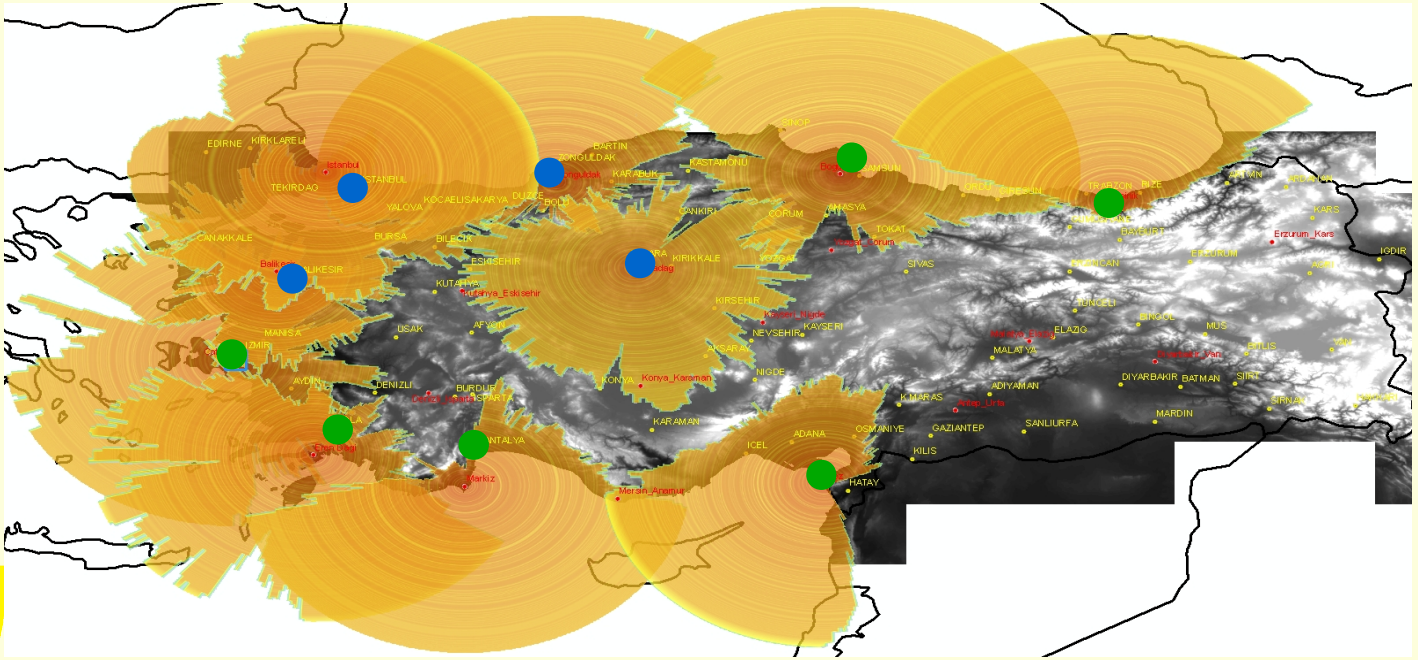


Introduction

Recent Investments

Radar Network

Installation has been started, 6 more radars will be installed up to 2012. Number of radars will be 10



Introduction

Recent Investments

Supercomputing

- A need for more computer resources is essential after ALADIN membership. ALADIN/ALARO/AROME needs more computer power than we had.

- Installation was completed by 2nd September 2009.

- Operational and final acceptance tests are still going on.

- Taking into operational service is expected by Mach 2010.

Introduction

Recent Investments

Supercomputing

	IBM P690	SGI Altix 4700
Architecture	SMP	NUMA
CPU	Power4 RISC	Intel Itanium2
Number of Cores	16 – 1.3 Ghz	512 – 1.7 Ghz
Peak Performance	~83 Gflpos	~ 3.4 Tflops
Memory	32 GB	1 TB
Operating System	AIX	SLES10
Fortran Compiler	XLF, GNU	INTEL, PGI, GNU
Network	Ethernet	Gigabit Ethernet & SAN
File System	Standard Internal	CXFS Shared File System

Introduction

Recent Investments

Supercomputing

GIGABIT LAN

SGI Altix 4700

512 Cores

4 X SGI Altix 450

Management Servers

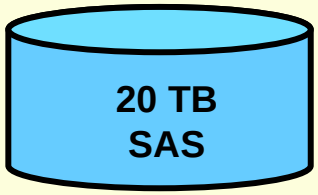
Linux Workstations

3 X DELL

Data and Product Server

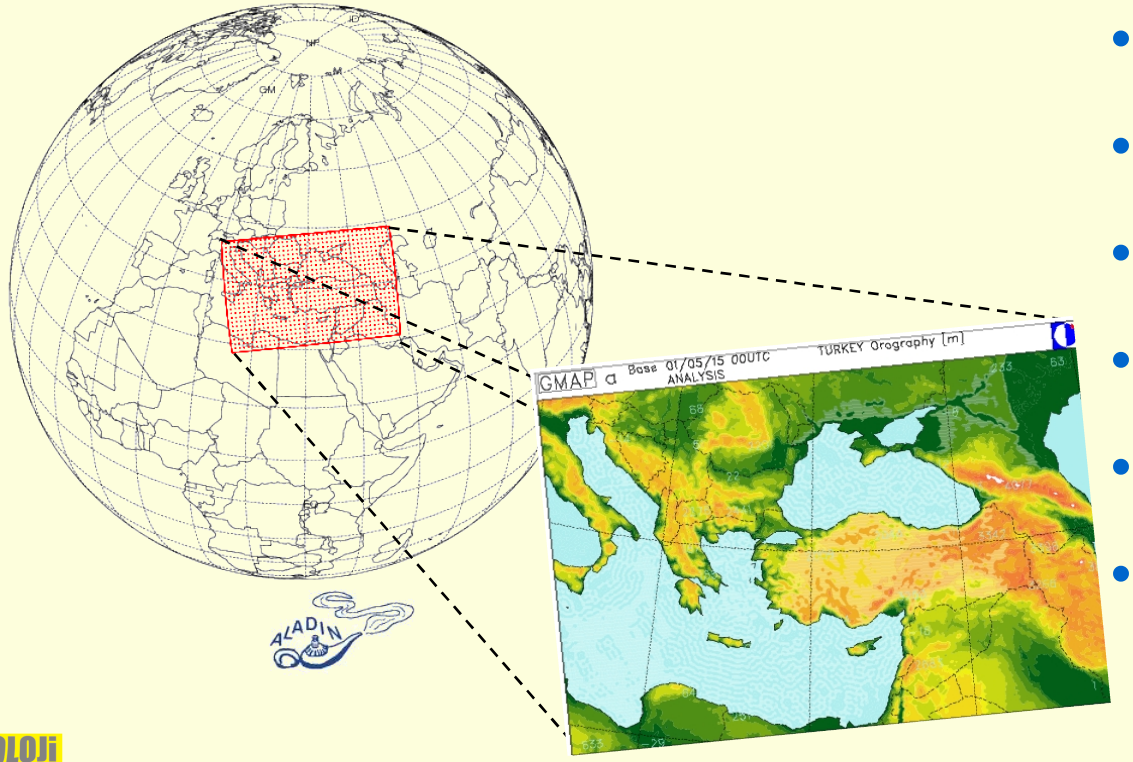
CXFS Shared File System

4 gbit/s FC connections to SAN



ALADIN at TSMS

Operational Configuration



- 46 Model Levels
- 10 km mesh size
- Digital Filtering
- At 00 and 12 UTC
- 48 Hrs Integration
- 3 hourly outputs

ALADIN at TSMS

Performance

Warning Issued…

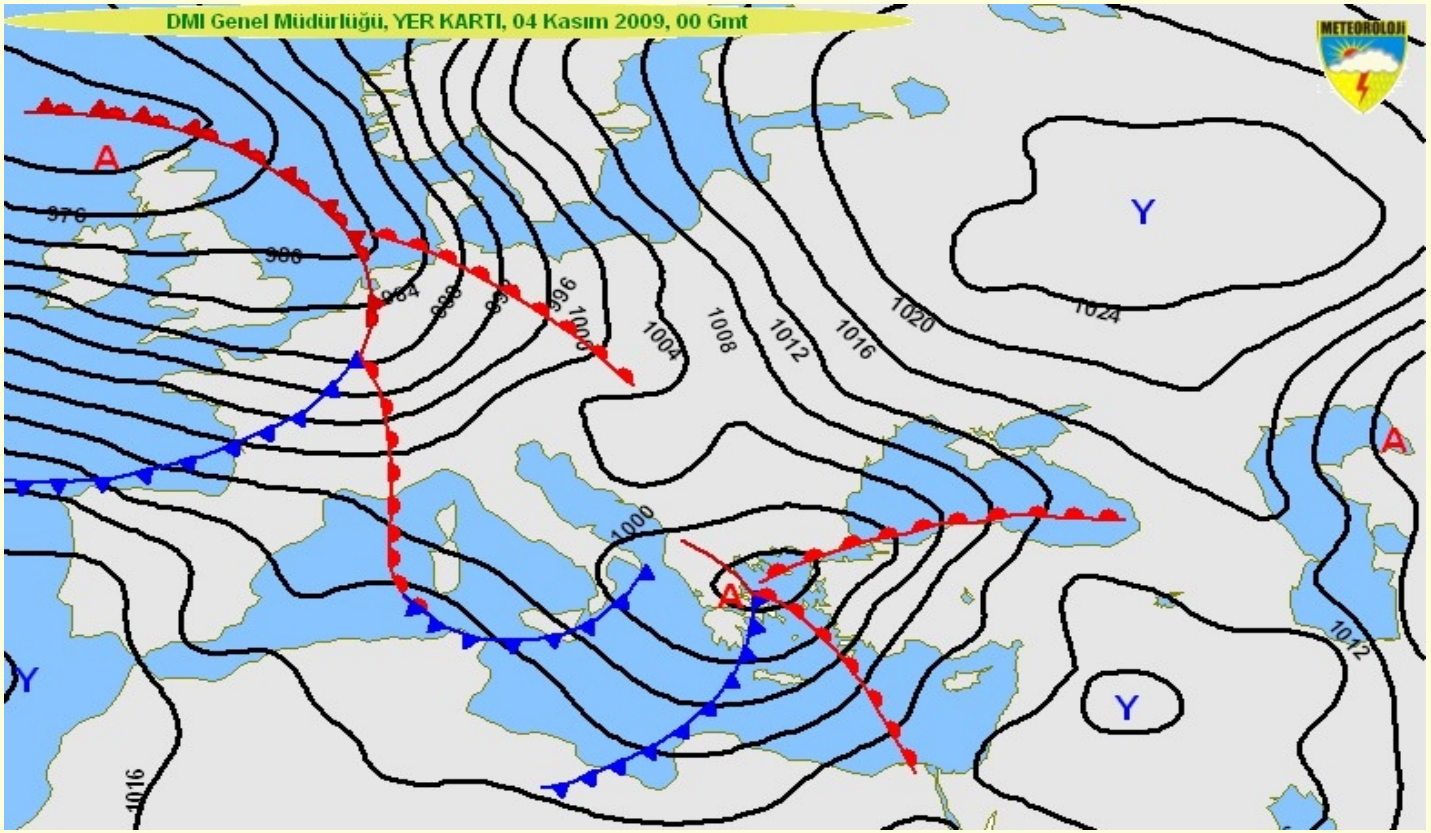
4 November 2009 in the morning, TSMS has issued a warning for Southwestern part of country. The warning was including heavy precipitation with severe wind gusts.

ALADIN at TSMS

Performance

Synoptic pattern

MSLP Analysis and Frontal Systems : **04 Nov 2009 00 UTC**

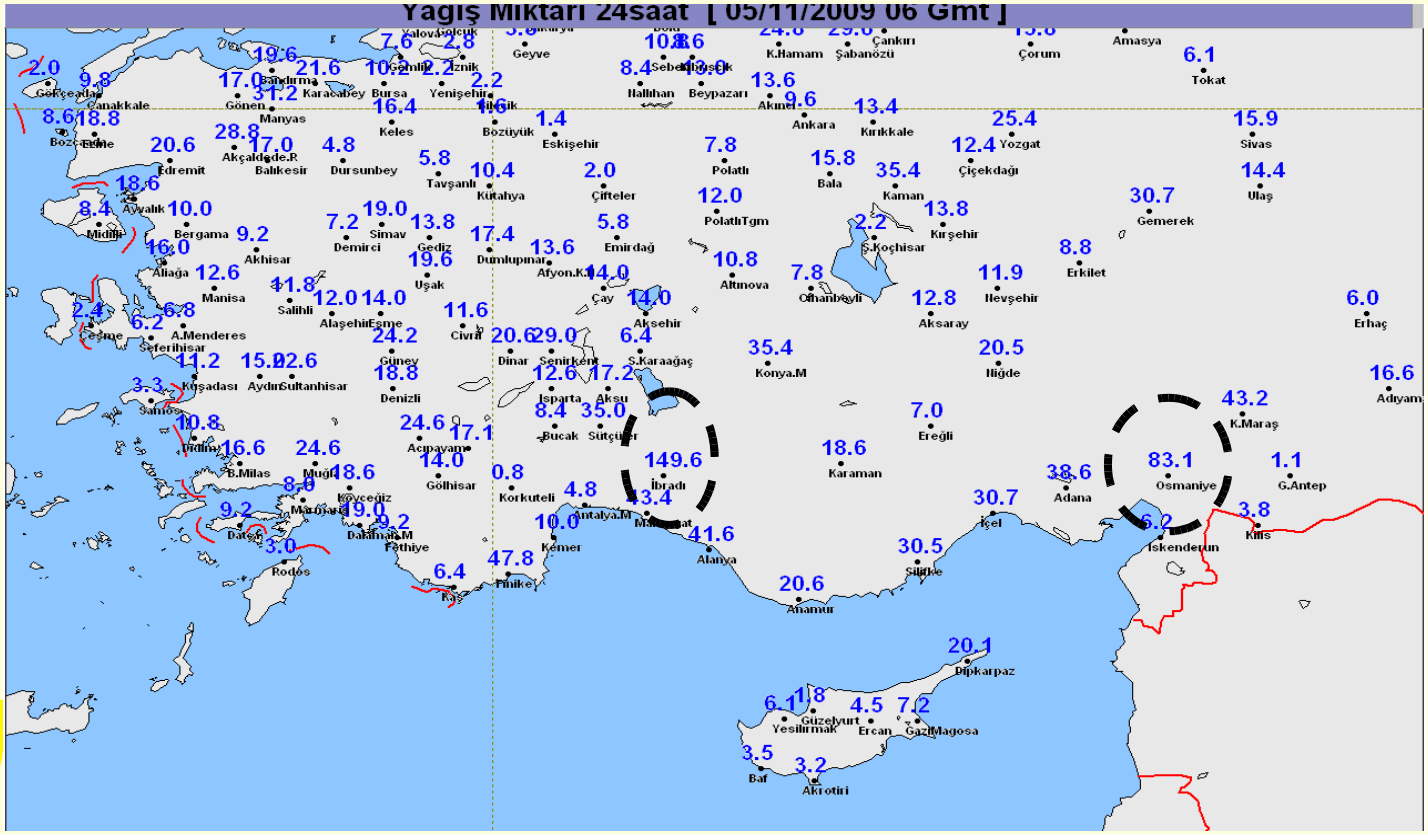


ALADIN at TSMS

Performance

Precipitation Observations

24 Hr Total Precipitation Values observed at 05 November 2009

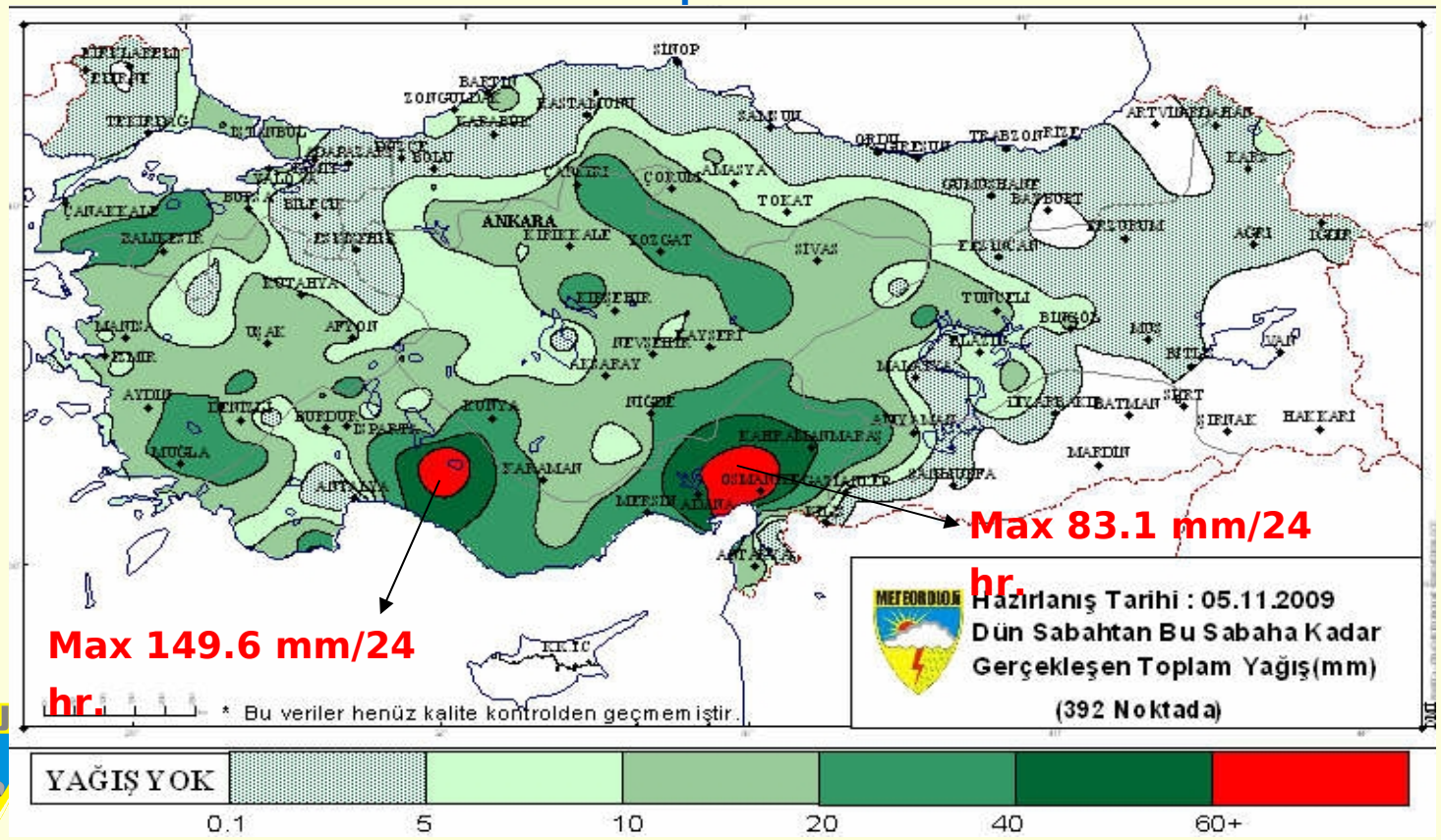


ALADIN at TSMS

Performance

Precipitation Analysis

24 Hr Total Precipitation : 05 November 2009

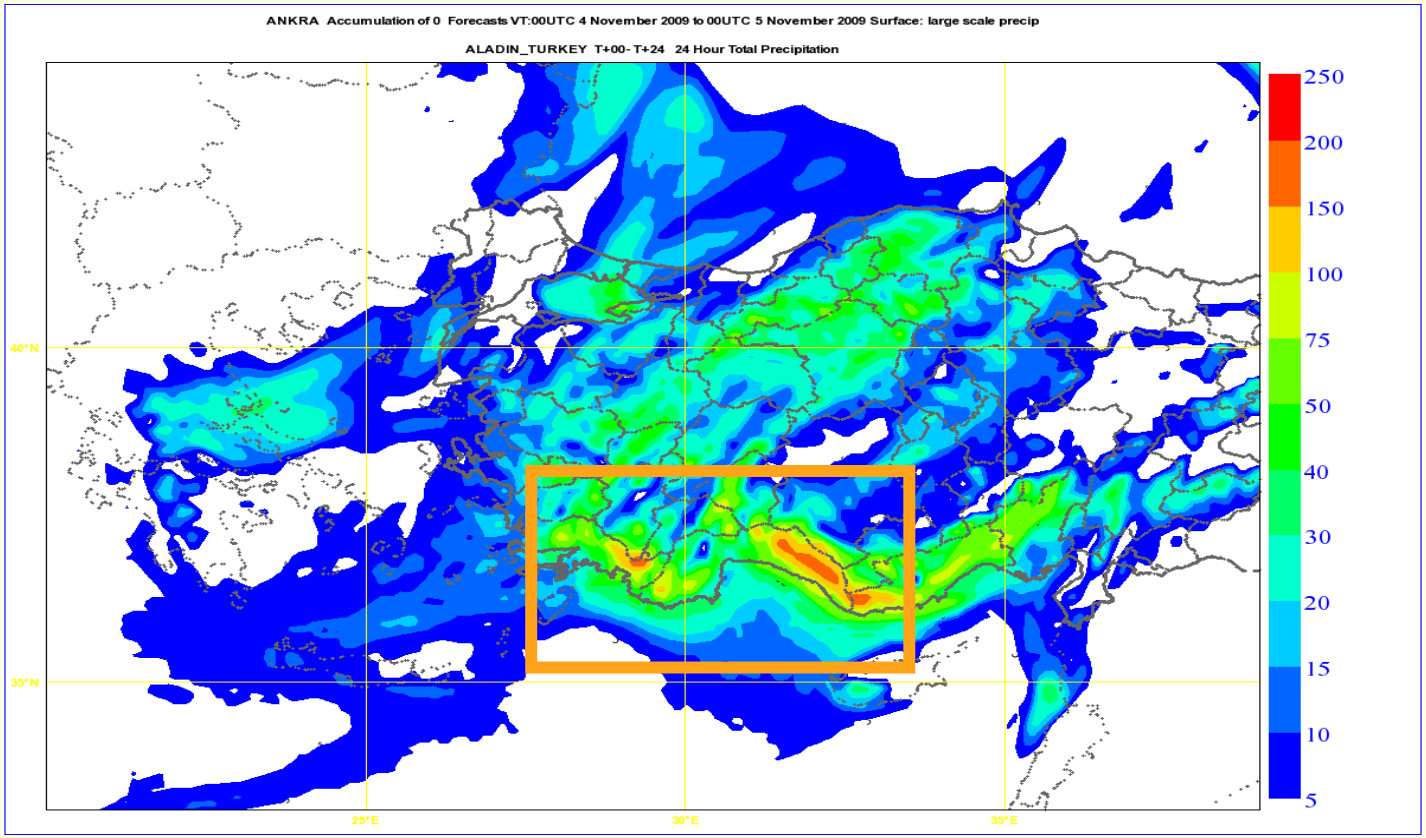


ALADIN at TSMS

Performance

ALADIN Precipitation Forecast

ALADIN 10 KM, 24 hr Total Precipitation Forecast: 04 Nov 2009 to 05 Nov 2009

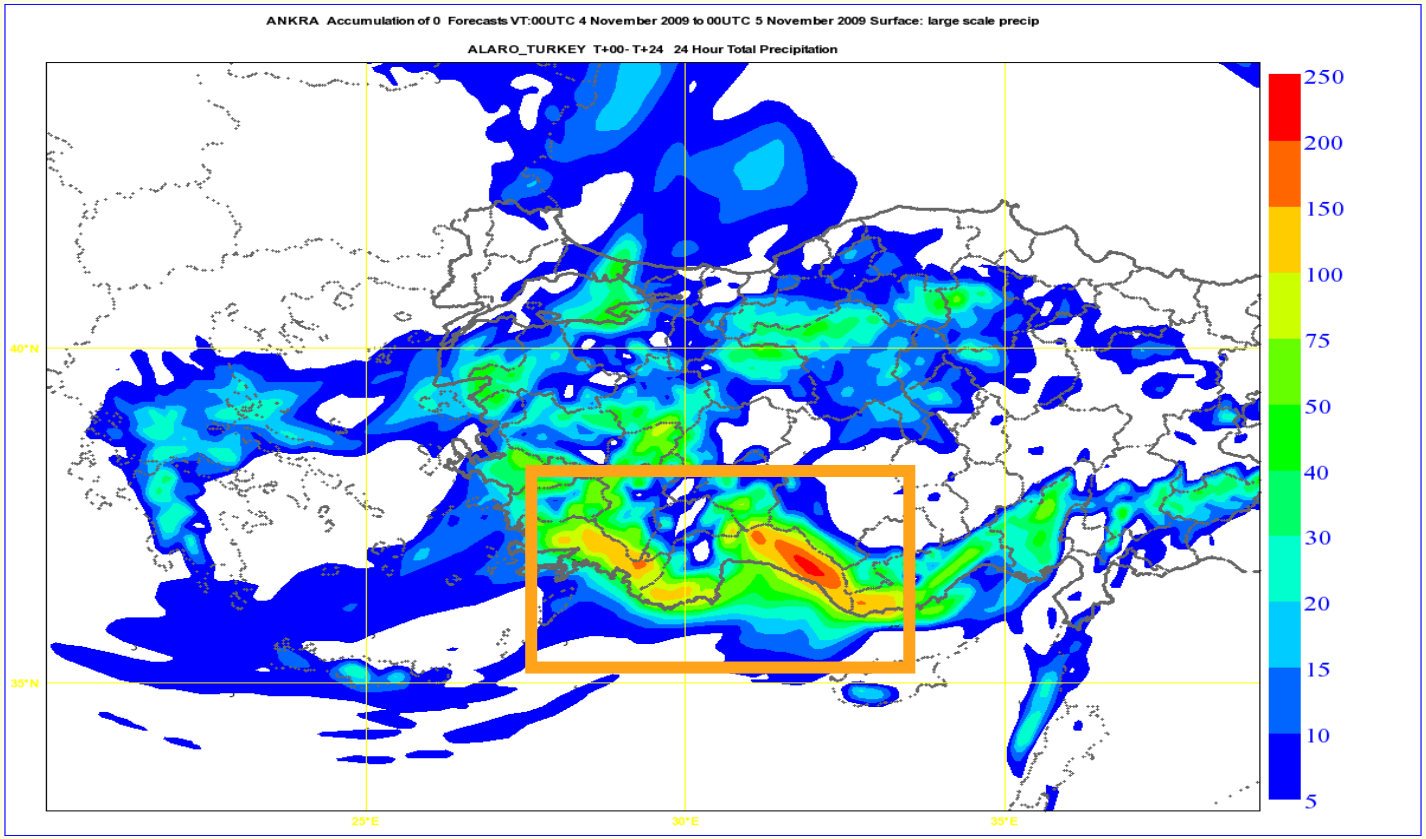


ALADIN at TSMS

Performance

ALARO-0 Precipitation Forecast

ALARO-0 with 3MT 4 KM, 24hr Total Precipitation Forecast: 04 Nov 2009 to 05 Nov 2009

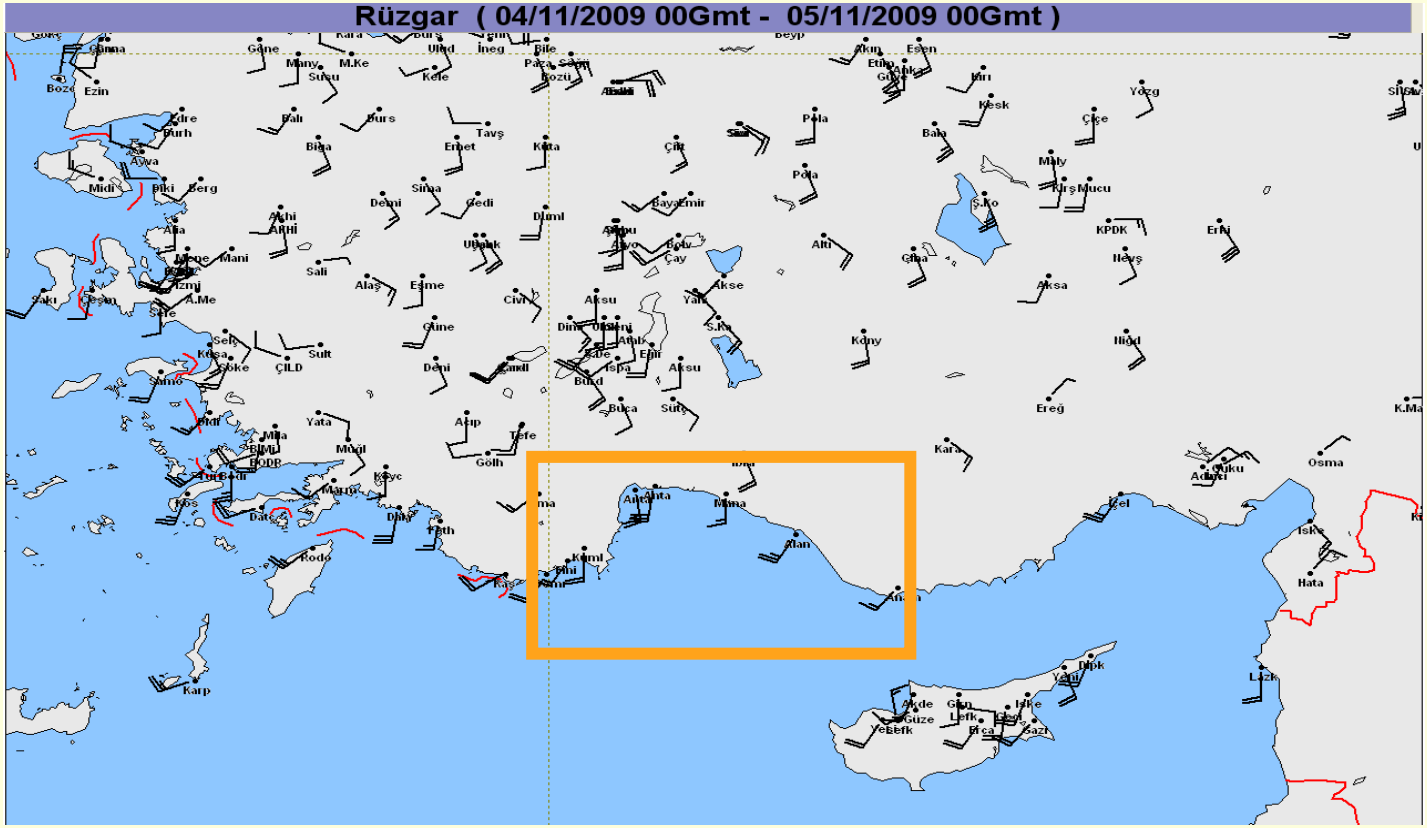


ALADIN at TSMS

Performance

Wind Observations

Observed Maximum wind speeds between : 04 Nov 2009 00 UTC and 05 Nov 2009 00 UTC

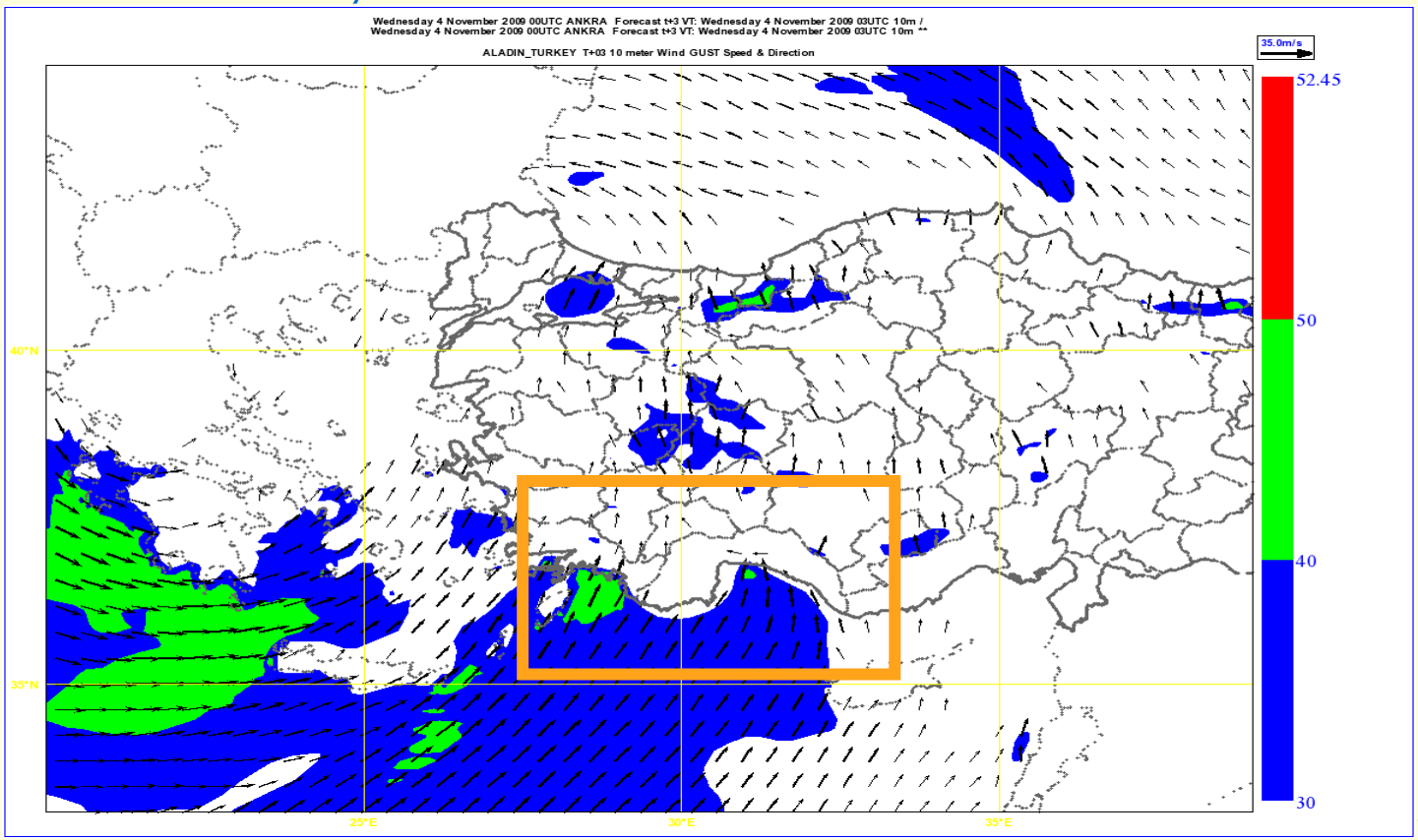


ALADIN at TSMS

Performance

ALADIN Wind Gust Forecast

ALADIN 10 KM, Wind Gust Forecast: From 04 Nov 2009 to 05 Nov 2009

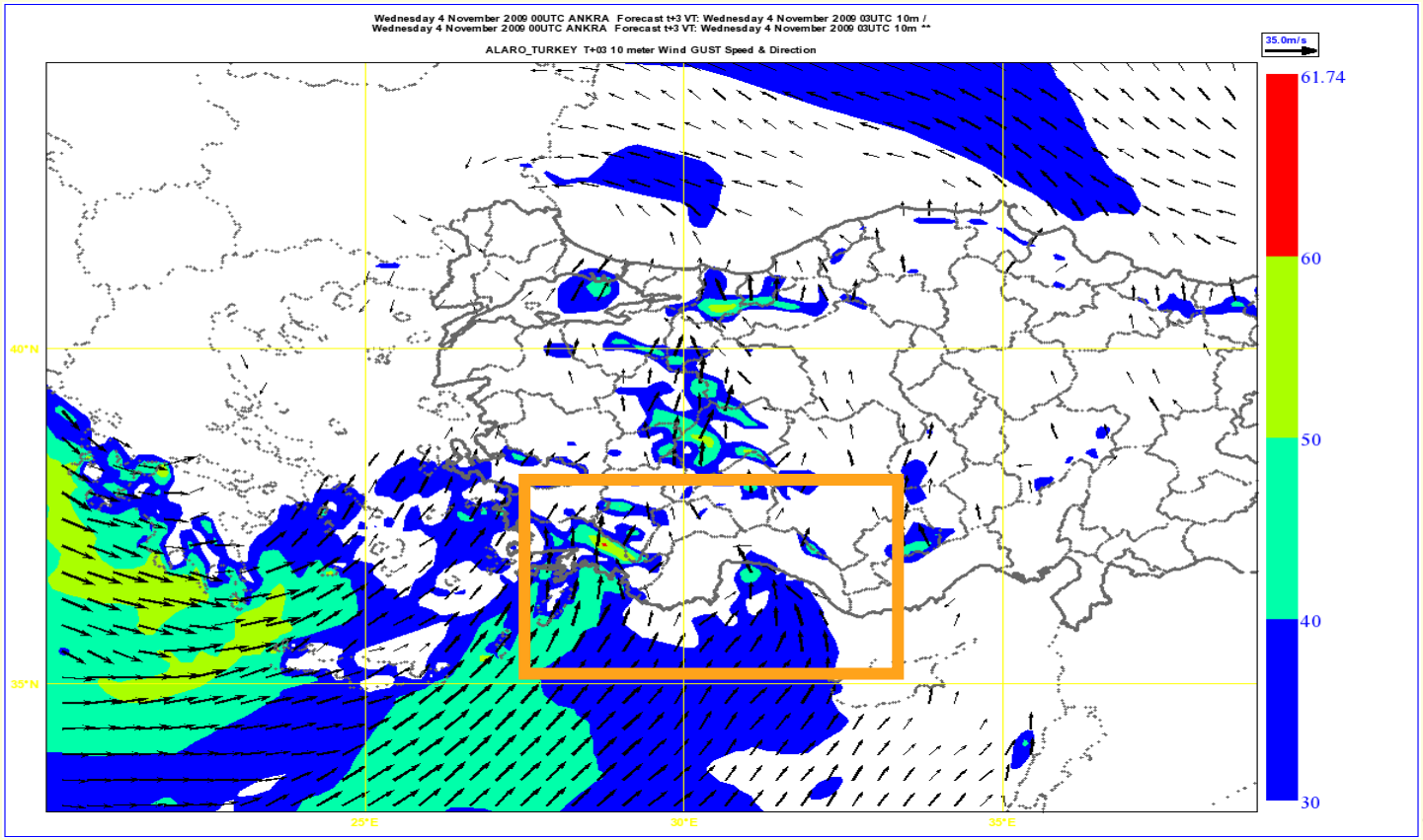


ALADIN at TSMS

Performance

ALARO-0 Wind Gust Forecast

ALARO-0 with 3MT 4 KM, Wind Gust Forecast: From 04 Nov 2009 to 05 Nov 2009



ALADIN at TSMS

Performance

Outcomes…

- Results of both model are satisfied.
- ALARO is more sensitive to topographical effects
- ALARO wind forecast is better than ALADIN.

ALADIN at TSMS

Future Plans

- 4 ALADIN cycle per day
- increasing horizontal and vertical resolution
- switch to ALARO-0
- experimental runs for AROME
- 3D VAR

ALADIN at TSMS

Thank you for your attention !