Use of Radar and Satellite Products in Nowcasting

Dr. Levent YALÇIN

Turkish State Meteorological Services
Duty and Responsibilities for Aviation Meteorology in TSMS

- Control and coordination duty and working of aerodrome meteorology office,
- Determine necessity of aerodrome meteorology office,
- Prepare and coordination their necessity plan and projector,
- Working in coordination with WMO, ICAO and NATO, Application their int. rules
- Coordination the relationship with General Staff (Military Forces) and TSMS
- Support national and international Military Operations,
- Attend the meeting, seminar and education concerning aeronautical meteorology
- Follow the AIP publication and provide the application,
Met Staff

• All meteorological office staff consist civilian persons

• Totally 700 personnel on duty in meteorological office

  • METAR
  • SPECI
  • TREND
  • TAF
  • AIRMET
  • SIGMET
  • GAMET
  • SWC
  • UPPER LEVEL CHART
  • BRIFING
International Relationship

• WMO

• ICAO/METG-MET ATM TF

• EuroControl

• NATO
  .. SHAPE
  .. MCMG
  .. WG+OPC
  .. BMWG
  .. ACOMEX

• ECMWF
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Meteorological Support for Military

OSTIV 2013 Meteorological Panel 20-21 Sep 2013, Alanya, TURKEY
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Meteorological Support for Heliports;

![Helicopter image]
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Meteorological Support for:

- Paragliding
- Parachute
- Glider
- Ballon
- Sailwing

OSTIV 2013 Meteorological Panel
20-21 Sep 2013, Alanya, TURKEY
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Products
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Products

Dataset: D2 RIP: ahcnggbbhnhnbibini
Init: 1800 UTC Wed 03 Jun 09
Valid: 1159 UTC Thu 04 Jun 09 (1459 LDT Thu 04 Jun 09)
Fest: 18.00 h
Clear air turbulence index
Horizontal wind vectors

Height (H = 1000)
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Dataset: D2  RIP: bgcghhbinkchncfbini  Init: 0600 UTC Mon 01 Jun 09
Fcast: 27.01 h  Valid: 0900 UTC Tue 02 Jun 09 (1200 LDT Tue 02 Jun 09)
Divergence
XY= 54.5, 53.3 to 65.7, 61.7

Horizontal wind vectors

Model info: V3.7.3 Grell  MRF PHL  Rainec 1 7 km, 32 levels, 23 sec
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Use of Radar and Satellite Products in Nowcasting

Run: 20032008 0000GMT  T+12
Valid: 20032008 1200GMT

EXCELLENT
(COK IYI)

GOOD
(IYI)

MODERATE
(ORTA)

POOR
(ZAYIF)

SOARING INDEKS HARITASI
Support Equipment

Use of Radar and Satellite Products in Nowcasting
Interfaces: HEZARFEN

• Hezarfen is a aviation meteorology web page,
• This is the first and unique web page about aviation meteorology in Turkey,
• purpose: support the aviation sector with meteorological product,
• Page get name from Hezarfen Ahmet Çelebi; “First Flying Turk” in 17.Century,
Use of Radar and Satellite Products in Nowcasting

Interfaces: www.hezarfen.mgm.gov.tr

For Mid and Upper Level Flights operation,

ICAO Annex 3 Standards
Recommended Practices (SARPs)
TSMS provides a web-page, accessed from the main TSMS website (mgm.gov.tr)

Hezarfen web site became operational in 2005.

Free at point of use, but users have to register their details (Address, Company, Phone etc..)

Website updated with latest forecasts (TAFs, GAMET) and observations (METARs, SPECI, SIGMET)
Use of Radar and Satellite Products in Nowcasting

- Met Airport Reports, Forecast and Warning (METAR, SPECI, TAF, SIGMET…)
- Significant weather charts, Wind and Temperature charts (SIGWX, WINTEM)
- Graphical aeronautical products (SIGWX, wind and temperature charts) for Upper Level Flights and Low-Level Flights,
- PDF-DOC-XLS styles are available for printing txt messages
- WAFC By the two World Area Forecast Centers (London and Washington)
- Presently the SIGWX charts for Low-Level Flights are not Cross-Section products for Low-Level Flights (HELIMET)
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Aviation Web Site - Main Page

Hezarfen

ENGLISH available

Duyuru
- Devlet Meteoroloji İşleri Genel Müdürlüğü tarafından Türkiye’de 8 noktası yapılan VHF VOLMET yayın sistemlerine ait detaylı tablo için tıklayın.
- ...

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METAR, TAF, SIGMET, GAMET Search
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METAR Decode

Hezarfen

METAR RASAT:
LTAC 150950Z 10004KT 9999 SCT050 SCT000 14/07 Q1021 M0807 RVR20 L
16004KT 050320 RVR050 08004KT 300350 RVR210 13004KT 090210 =

SAAT: 10:10 Z

Havacılık Sayfasi

Kod Açıklaması - Windows Internet Explorer


Bitti
Use of Radar and Satellite Products in Nowcasting

Flight Documents, Synop Charts, NWP, Radar and Satellite Images

SIGWX Charts from WAFC

Regions

- EUR
- SOUTH ASIA, NAT
- MIDDLE EAST
- EAST
- SAT
- AFI AUSTRALIA
- AMERICA
- PAC
- ASIA

Period 00,06,12,18
Use of Radar and Satellite Products in Nowcasting

For Low Level Flights

Route 1 to 2
Route 2 to 3
Türk Uç Met

Goal;

To provide a web site which contains all meteorological data and products required for the national and international flights,

To provide a user-friendly web site which the users can easily access to the data and products,

Türk Uçmet contains 4 different web applications for aviation sector
AWS Data Presentation
• This web application contains the actual meteorological data for the runways

BULLETIN SEARCH
• Bulletins, charts and meteograms can be retrieved by this application

FLIGHT ROUTE
• Flight documents for the defined route can be prepared by this application

WEATHER REPORT
• The meteorological conditions for the whole world area can be accessed by this application
### AWS Data Presentation

<table>
<thead>
<tr>
<th>Airport</th>
<th>Runway 1</th>
<th>Runway 2</th>
<th>Runway 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATATÜRK</td>
<td>35R - 17L</td>
<td>35L - 17R</td>
<td>05 - 23</td>
</tr>
<tr>
<td>ESENBOĞA</td>
<td>03R - 21L</td>
<td>03L - 21R</td>
<td></td>
</tr>
<tr>
<td>ANTALYA</td>
<td>36C - 18C</td>
<td>18L - 36R</td>
<td></td>
</tr>
</tbody>
</table>

**Visibility**
- Meteorological Event
- Air Pressure (QNH, QFF inch-hPA)
- Temperature (°C)
- Cloud base height (feet)
- Humidity
- Actual METAR bulletins
- Actual TAF bulletins
### Bulletin Search

<table>
<thead>
<tr>
<th>Bulletin Type</th>
<th>Time Information</th>
<th>ICAO List</th>
<th>Retrieval</th>
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<tbody>
<tr>
<td></td>
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</tbody>
</table>

### ICAO List

<table>
<thead>
<tr>
<th>ICAO Code</th>
<th>Bulletin Details</th>
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</thead>
<tbody>
<tr>
<td>LTAC</td>
<td></td>
</tr>
<tr>
<td>SBGR</td>
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<td>KLAS</td>
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<td></td>
</tr>
</tbody>
</table>

### SWC, Wind and Temperature Charts

- Use of Radar and Satellite Products in Nowcasting
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Flight Route
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Some important beings for Low Level Flights: DOWNBURSTLER
Some important beings for Low Level Flights: MİKROBURST
Radar network, World
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Radar network, Turkey
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Radar runs

The COMET Program
Radar outputs
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Meteorological satellite network

- FY-1/3 (China)
- Terra NPP
- Jason-1 Okean series
- GMS-5/MTSAT-1R (Japan) 140°E
- COMSAT-1 (Republic of Korea) 120°E
- GPM ADEOS II GCOM

Other R & D oceanographic, land use, atmospheric chemistry and hydrological missions

- Aqua QuickScat TRMM
- MSG (EUMETSAT) 0°Longitude
- METEOSAT (EUMETSAT) 83°E
- METEOR 3M N1 R & D orbit
- METEOR 3M (Russian Federation) 850 km
- GOES-R (USA) 75°W
- GOES-R (USA) 135°W
- ENVISAT/ERS-2
- SPOT-5
- NPOESS (USA)
- Metop (EUMETSAT)
- GOES (EUMETSAT) 0°Longitude
- INSATs (India) 105°E
- GOMS (Russian Federation) 76°E
- 18,900 km
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microburst on Doppler radar

From pilots to meteorologist
Satellites “see” cumulus before they become thunderstorms
Middle level danger

SINGLE CELL STORMS
High level danger

MULTICELL CLUSTER STORMS
High level danger!
Supercell sample
Case study: A grasshopper crash (12th Aug 2012)

Lisa Şener, 39
> 50 h, PPL

From İstanbul Hezarfen to Edremit Seyit Onbaşı

Cirrus TC-SAS

Hikmet Aral, 65
> 6000 h, CPL
Use of Radar and Satellite Products in Nowcasting

Case study: A grasshopper crash (12th Aug 2012)

Different types of satellite views
Use of Radar and Satellite Products in Nowcasting

Case study: A grasshopper crash (12th Aug 2012)

Different types of satellite views
Use of Radar and Satellite Products in Nowcasting

Case study: A grasshopper crash (12th Agu 2012)

Different types of satellite views
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Different types of Radar views
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Different types of Radar views
Case study: A grasshopper crash (12th Aug 2012)

Different types of Radar views
Case study: A grasshopper crash (12th Aug 2012)

Different types of Lightning views
Case study: A grasshopper crash (12th Agu 2012)

Different types of Lightning views
Use of Radar and Satellite Products in Nowcasting

Case study: A grasshopper crash (12th Agu 2012)

Meteorolojik Uyarı

Warning by TSMS: 12.08.2012 06:00 - 13.08.2012 18:00
Case study: A grasshopper crash (12th Agustus 2012)

- TSMS gives warning!
- Forecaster forecasts thunderstorm!
- Observer reports CBs!
- Tower forwards reports!

Pilot goes on her own way!!!
Use of Radar and Satellite Products in Nowcasting

Case study: A grasshopper crash (12th Aug 2012)

Lisa Şener, 39
> 50 h, PPL

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Please be on the watch meteorologists!
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And enjoy your flights…
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Thanks,

Questions?

Dr. Levent YALÇIN
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TSMS