# **ROMIO Oceanic Demonstration**

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NCAR RESEARCH APPLICATIONS

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# **ROMIO Demonstration Display**



ROMIO pilot IPad demonstration display of Cloud Top Height (CTH), in grey scale, and Convective Diagnosis Oceanic (CDO), in color. DAL081 flight route in magenta.

# Remote Oceanic Meteorological Information Operational (ROMIO) Demonstration

- **Operational demonstration** to evaluate the *feasibility* to uplink convective weather information to aircraft operating over the <u>ocean and remote regions</u>
  - Cloud Top Height (CTH) product
  - Convection Diagnosis Oceanic (CDO) product
- Explore strategies for using rapidly updated CTH/CDO weather products in the flight deck, by Pilots, Airline Operations Centers (AOC), and by Oceanic Air Route Traffic Control Centers (ARTCC)
  - Supplemental use only
- **Understand benefits** associated with providing updated convective weather information to flight deck, ARTCC, and AOCs
  - Feedback from pilots, dispatchers, controllers being collected/analyzed



## The CTH and CDO Products

### CTH = Cloud Top Heights

- Above 15kft
- For optically thick clouds
- Derived from Satellite and Model
- Updates every 10 minutes

#### CDO = Convection Diagnosis Oceanic

- Detection of convective hazards, giving additional information to the CTH.
- Hazard indicator (0 to 6).
- Derived from Lightning, Model, and Satellite
- Values >= 2 indicate a convective hazard is likely
- Values >= 3 indicate lightning and/or an overshooting top is present.
- Updates every 10 minutes



- Two products better characterize convective storm
- CTH gives full extent of cloud cover and height
- CDO shows location of updraft/lightning hazards

## **ROMIO Demonstration** Details

#### Covered the GOES-East, GOES-West & Himawari Satellite's domains

• Nominal 10 min updates, latest data

#### **CTH product**

- Maps 11 micron IR brightness temperature to height using GFS sounding
- Contours cloud top height (FL320-FL400)

#### **CDO** product

- Data fusion of 3 satellite-based algorithms plus ground-based, geostationary lightning
- Interest or likelihood field
- Values from 2-5

#### Gridded products turned into polygons

- Reduces bandwidth
- Polygons are representation of products

#### Flight Routes:

- CONUS to/from international destinations
- Inter-Tropical Convergence Zone
- Entire route seen, beyond range of onboard weather radar
- Improve situational awareness

# **ROMIO Oceanic Demonstration Display**

ROMIO pilot IPad demonstration display in dark mode.

Cloud Top Height (CTH), in grey scale

Convective Diagnosis Oceanic (CDO), in color

UAL844 Flight route in magenta





## ROMIO Participants & Communications Architecture Overview



Acronyms