

Algorithm Information Background

The UW-CIMSS Advanced Dvorak Technique (ADT) is a mature algorithm utilized to objectively estimate the intensity of tropical cyclones using geostationary infrared data and polar-orbiting passive microwave data. It is based upon the manual (and subjective) Dvorak Technique, but has advanced beyond the scope of the technique. The ADT is currently used around the world by many operational Tropical **Cyclone Forecast Centers.**



Latest Statistics

The ADT has been validated storm-by-storm and basin-wide for the global 2015 tropical cyclone seasons. Validation was performed versus Best Track data from the National Hurricane Center and the Joint Typhoon Warning Center in all basins, however the North Atlantic basin requires coincident reconnaissance aircraft data. Validation statistics for all basins (three are shown here) are similar but indicate that more work regarding the ADT intensity estimates for individual basins to alleviate biases might be needed.



Webpage

Real-time ADT intensity estimates and product information can be found on the CIMSS Tropical Cyclone website at : http://tropic.ssec.wisc.edu/real-time/adt

Acknowledgements

ADT research and development has been supported by ONR/NRL and NOAA/ NESDIS research programs.

The Current Status of the UW-CIMSS Advanced Dvorak Technique (ADT) Timothy Olander and Christopher Velden Cooperative Institute for Meteorological Satellite Studies (CIMSS) University of Wisconsin – Madison

Extratropical Transition

Research led by Clark Evans from UW-Milwaukee to investigate an extension to the ADT for storms undergoing ET has suggested an intensity adjustment is needed. Two schemes to integrate this adjustment, utilizing Bob Hart's cyclone phase space files to identify when ET begins, are being evaluated.



Hurricane Patricia provided a unique and challenging test for the **ADT** due to its rapid intensification and extreme maximum intensity. When compared to aircraft reconnaissance, the real-time ADT provided remarkably accurate intensity estimates.



ARCHER 2.0 graphical output for Super Typhoon Soudelor (13W, 2015)

The ADT automated storm center determination process is being updated to utilize the newly-available ARCHER 2.0 algorithm. TC center positions will be objectively derived in real time using a weighted combination of LW-infrared, SW-infrared, visible and microwave imagery, as well as scatterometer data.



Coincident availability of MTSAT and Himawari-8 data in 2015 allowed for a detailed study of the impact of improved spatial and temporal data on the ADT performance. Minor statistical impact was observed overall, with small impacts noted within individual storms.

Hurricane Patricia AIRCRAFT RECON 400 AM CDT THU OCT 22 2015

WS NATIONAL HURRICANE CENTER MIAMIE isity estimate is set at 75 kt, which is above the Dvoral

ARCHER 2.0 Integration

STORM NAME : 20E



Pre-Genesis Identification and Tracking

Development of a scheme to objectively identify and track pre-tropical systems using satellite imagery has produced mixed results, and more study is needed. The algorithm will eventually serve as a 'front end' to the ADT to help identify systems becoming a tropical depression.



Related Topics at AMS-TC2016

A study of the most historically intense tropical cyclones from around the globe during the geo satellite era, as analyzed by the ADT, was performed to determine a "Top Ten" list. What was the strongest storm? Gilbert? **Tip? Patricia? Wilma?**



Future Upgrades Subtropical Storm Analysis

Another application requested by users is the ability to employ the ADT on subtropical systems. Preliminary work on this extension has begun and will focus on determining whether a bias adjustment, as with the ET work, or a new scene type (or modification of the current Curved Band type) is needed.



McIDAS-V Integration

An initial version of the ADT has been developed to operate within the **McIDAS-V** platform to provide potential ADT users a free, shareware version of the algorithm. This "lite" version would allow users to run the ADT on a variety of satellite data formats for research needs.

