The McIDAS-V ADT (McV-ADT) is still experimental and may have bugs that have not been found through testing. More information about the ADT and various run-time options, algorithms, and program outputs can be found in the McIDAS-X ADT-Version 8.2.1 Users' Guide at http://tropic.ssec.wisc.edu/misc/adt/info.html

Run-Time Image Analysis using the McV-ADT

To operate the McV-ADT, first select and display a satellite image within the McIDAS-V Image Display Window using the Data Explorer. A single image or a series of images can be selected either from any remote data server available or from any locally server. Once a single image or several images have been selected, press the "Add Source" button at the bottom of the Data Explorer window in the Data Sources tab. The Field Selector tab will then list the data type selected. Select the "Temperature" calibration for your desired band. In the Displays panel, select the "Imagery Display" option and press the "Create Display" button at the bottom of the window. The image (or images) will then be displayed in the Image Display Window.

To initiate the McV-ADT, return to the Data Explorer window and select the Advanced Dvorak Technique (Under Development) display type and click Create Display. The GUI to control the ADT application will then be displayed in the "Layer Controls" tab of the Data Explorer.

In order to execute the McV-ADT, the tropical cyclone (TC) storm center must be selected either subjectively or objectively using either the Manual or Automated options, respectively, adjacent to the "Storm Center Selection" label at the top of the window. If the Manual option (default) is utilized, the storm position is selected manually by the user in the Image Display Window. To select the storm center, left-click and drag the probe in the Main Display window. A colored dot will mark the storm position selected, with the corresponding position displayed in the ADT GUI window in the Latitude and Longitude text boxes in the "Manual Storm Selection" section. Run ADT Analysis can be clicked to run the analysis as-is, which will appear in an ADT Results window.

If the Automated option is selected, the options in the "Automated Storm Selection" section will be made active allowing the user to select a file from which to obtain a first guess position. These files can be official Storm Forecast or Best Track files from tropical cyclone forecast centers worldwide in several different formats. The "Select Forecast File" button allows the user to select the input forecast file, while the adjacent pull down menu defines the type of input file being used. The default directory location of the input forecast file is defined with the ODTAUTO variable in the adtenv file located in the edu/wisc/ssec/mcidasv/adt directory located within the McIDAS-V home directory of the local system. If the adtenv file is not utilized, the $HOME directory will be the default directory. Run ADT Analysis can be clicked to run the analysis as-is, which will appear in an ADT Results window.

If an ADT History file is to be utilized, click on the "Select History File" Button in the "History File Information" section and select/define a history file to be used. The default directory is defined by the ODTHISTORY variable in the adtenv file outlined above (or the $HOME directory if not using the adtenv file parameters). The ADT History file can be used in either Automated or Manual storm center selection mode.

To run the ADT, once the storm selection method and the use of a history file have been chosen, click on the blue "Run ADT Analysis" button at the bottom of the screen. Once the analysis has completed a popup window will appear containing the ADT Analysis Bulletin output for the image being investigated.

Other options are available to augment the ADT analysis. The Passive Microwave (PMW) Analysis section allows the user to input an "Eye Score" value associated with a microwave overpass of the TC (along with the date and time of the overpass). This information will be utilized to identify an eye in the PMW imagery when the corresponding IR image does not show an eye feature (clearly). At this time, the inline, automated PMW image analysis routines are not available in the McV-ADT, as they are in the McIDAS-X ADT-Version8.2.1. Only manual input of the overpass "Date", "Time", and Eye "Score" values, derived using an external processing system, can be utilized. This PMW information can be found online at :

  http://tropic.ssec.wisc.edu/real-time/mimic-tc/<storm_ID>/intenScores/intenTable.html

Where <storm_ID> is the storm year and 3-character WMO ID for the storm in yyyy_xxx format, where yyyy = year (e.g. 2014) and xxx = storm ID (e.g. 18W, 03L, etc.). For example, for storm 05W in 2015, the storm_ID parameter will be 2015_05W.

To initiate the "PMW Analysis" section, click on the "Activate" checkbox. The "Manual" entry option button will be activated along with the three text entry boxes corresponding to the PMW overpass Date, Time, and Eye Score values. Please note that you MUST press "Enter" on the keyboard after entering input into each text window! The "Automated" option will be grayed out since this option is not available in this version of the McV-ADT, as mentioned above. Also note that the use of the PMW Analysis is only available when utilizing an ADT History file.

Other run-time options for the ADT analysis are located in the "Miscellaneous Options" section of the ADT Layer Controls tab. Please refer to the ADT Users' Guide for more information on how these options work and any input/output parameters.

- "MSLP Conversion Method" defines the methodology used to convert the CI#/Wind Speed value to mean sea level pressure. The "Dvorak" option (default) will utilize the historical Atlantic or West Pacific conversions. The "CKZ" option will use the "Courtney/Knaff/Zehr" conversion, which requires two input parameters to be supplied to the conversion equations; Environmental MSLP (Penv) and the 34-knot wind/Gale radius (34kt Radius). These values can be found in the official Tropical Cyclone Forecast Center ATCF Best Track "b-deck" files provided by the National Hurricane Center, Central Pacific Hurricane Center, or the Joint Typhoon Warning Center. Make sure to press ENTER after entry of each of the two values in the text boxes!

- "Manual Scene Override" allows the user to manually change the automated scene type determined by the ADT algorithm, if desired. After the ADT Analysis is initiated, a popup window will appear listing the current scene type and provide a pulldown menu which lists the eight valid scene types from which the user can choose from. If the user agrees with the automated scene type provided, the "Keep Current Scene" button is pressed and the analysis will continue utilizing that scene type. If the user wishes to

change the scene type to another, the desired scene type is selected and the "Accept New Scene" button is pressed. The analysis will continue utilizing the newly selected scene type.

- "Land Flag" allows the ADT to operate over land if the "OFF" radio button is selected (default selection is "ON", which will keep the land flag activated and forbid ADT analysis when the storm center is over a significant land feature).

- "VMax" allows the user to select the conversion method for displaying the maximum wind speed value, either in terms of a "One-minute" average (default) or a "Ten-minute" average wind speed.

- "Raw T" allows the user to manually define the initial Raw T# value for a newly defined storm when utilizing a history file. The Analysis Bulletin output will indicate that the user has selected the input Raw T# value for the initial storm intensity, and this value will be assigned to all intensity estimate values within the storm's history file for the first record. This value is only utilized when a history file is newly defined and/or the record is the first record in the history file.

- "RMW" allows the user to manually input the Radius of Maximum Wind value when an Eye Scene type is determined and/or manually entered. This is especially important if the user wishes to define a pinhole or large eye value when the ADT is not able to objectively determine an eye size.

- "ATCF Output" allows the user to write an ATCF formatted intensity record to an output file (location defined with the ODTOUTPUT variable in the adtenv file). The name of the file is automatically determined and is based upon the image date and time along with two manually input variables. To initiate the production of this output, the "Activate" box should be checked and two inputs will be entered in their corresponding text boxes; the Storm ID and the Site ID. Storm ID = 3-character WMO storm identification (e.g. 12W, 04L, 22E, etc.) Site ID = 4-character identification for the site where the ADT analysis was produced (e.g. TAFB, CIMS, JTWC, etc.)Make sure to press ENTER after entering the individual values into the text boxes!

History File Operations

McV-ADT users can perform several operations on an existing ADT History file. To initiate, first select a history file in the "History File Information" section by clicking on the "Select History File" button and choosing a history file. Once a history file is chosen, press the "List/Write History File" button at the bottom of the "Layer Controls" tab. A new popup window will be displayed containing the history file listing of the selected history file along with two buttons at the bottom of the window.

The "Write History" button will write the contents of the history file listing to an output file. The default directory location of the output file will be defined by the ODTHISTORY parameter in the adtenv file described above (or the $HOME directory if not utilized). A popup window will be presented where the user can type in the name of the output file desired. Press the "Save" button to write the output file in the default directory location, or first select a new destination directory with the pulldown menu and/or button options to the left of the "Save in:" label at the top of the window.

If the user wishes to list the contents of the history file in ATCF format instead of the basic history file listing format outlined in the previous paragraph, press the "Write ATCF" button. The output file name and location will be presented/defined in the same manner as above but the contents of the file will be in ATCF format. Make sure that the "Storm ID" and "Site ID" values are defined in the "ATCF Output" text boxes in the "Miscellaneous Options" section so that these parameters get properly filled within the ATCF file.

IMPORTANT NOTE: There is a known bug when editing a history file which included PMW information! Improper date, time, and/or eye score values may be entered into the history file for all records following the deleted/modified record(s). PLEASE USE CAUTION WHEN EDITING/MODIFYING history files! This bug is currently being investigated.