MWIPP version 1.2 – Release Note

14 February 2023

1. Introduction

MWIPP is a software package designed to perform pre-processing on microwave imager data. For general information, see the MWIPP web page on the NWP SAF web site:

https://nwp-saf.eumetsat.int/site/software/mwipp/

Version 1.2 is an update release with the following main change from v1.1:
- Support for the November 2022 EUMETSAT release of simulated data for MWI and ICI on EPS-SG
- Correct the solar angles for AMSR-2

Details of changes:
- The new MWI/ICI test data has fixed length string attributes at top level, which can be read with the netCDF Fortran API. The code switches to the hdf5 API if the old test data are being processed.
- Some missing datasets have been added for MWI/ICI ingest, including: roll, pitch, yaw, satellite altitude.
- Update satellite and instrument codes, which have now been published by WMO (Common Code Tables C05 and C08, see https://community.wmo.int/activity-areas/wis/latest-version)
- In BUFR output from *mwipp_write_bufr_usergrid_mod.f90*, some extra checks have been added, and the sequence adjusted such that the scan line number can be up to 8191.
- Updated test case MWI_ICI.tgz
- AMSR-2 solar zenith and azimuth angles in MWIPP products have been corrected and are now consistent with those from other instruments, i.e. the solar zenith and azimuths angles are relative to local vertical and due north respectively.

2. Documentation

For details on the software capabilities and how to install and run the package, please see the **MWIPP User Manual**, which is linked from the MWIPP web page.

The following reference documents are also available via the web page and are unchanged:

- MWIPP version 1 Product Specification
- MWIPP version 1 Top Level Design
- MWIPP version 1 Test Plan

3. Distribution mechanism and package files

The software is distributed via the NWP SAF web site. A login is required to access the software, see https://www.nwpsaf.eu/site/login/. Click on the "software downloads" link at the top of the page, then select "Change Software Preferences", tick the MWIPP box and "Update Software

Preferences". You will then be given access to a gzipped tar file containing the latest release, shown in Table 1.

Table 1: MWIPP source code file

File name	Size	Purpose
MWIPP_v1.2_20230124.tgz	75 kB	MWIPP source code

You may also wish to download some of the test cases, which are linked from the MWIPP web page and listed in Table 2. Also available is a tar file containing a selection of Reduced Gaussian grids in GRIB format, which have been made available by ECMWF and can be useful for re-mapping the microwave imager data.

Table 2: MWIPP test cases (at https://nwp-saf.eumetsat.int/downloads/mwipp_testcases/)

File name	Size	Purpose
SSMIS.tgz	40 MB	SSMIS test case
AMSR2.tgz	105 MB	AMSR-2 test case (reference results updated)
GMI.tgz	5.2 MB	GMI test case
MWRI.tgz	48 MB	MWRI test case
ECMWF_grids.tgz	0.84 MB	Reduced Gaussian grids from ECMWF
MWI_ICI.tgz	706 MB	MWI and ICI test case (full orbit)

4. License

To use this software, users will need to agree to the terms of the NWPSAF License Agreement. The License Agreement is displayed when a user is logged into the NWPSAF web site and chooses to change software preferences. It can also be viewed here: https://nwp-saf.eumetsat.int/site/software/licence-agreement/.

5. System requirements

A linux operating system is required. MWIPP has been tested on RedHat Enterprise Linux 6 and 7, 64-bit.

A Fortran90 compiler that supports Fortran2003. The recommended compilers are gfortran or ifort.

The MWIPP software does not occupy significant disk space (~10MB when built). You will need space for your own data. We recommend that the system has at least 6GB of memory.

You will need the following libraries to be installed on your system:

- ecCodes
- hdf5 with Fortran90 and Fortran2003 interfaces
- For building the MWI/ICI software, you also need netCDF (C and Fortran)

If they are not already installed, the MWIPP User Manual contains instructions on how to download and build these packages. Please note that ecCodes installation requires "cmake".

In general, Administrator privilege is not necessary to build MWIPP.

MWIPP output products are generally in hdf5 or BUFR. For viewing hdf5 outputs a Python utility (requiring python2.7 or later) is provided as part of MWIPP. This makes use of *Cartopy*[1], *numpy*, *h5py* and *matplotlib* . If these packages are not available on your system, you can still run the core programs of MWIPP, but will not be able to generate the quick-look maps.

6. Building MWIPP

Prior to installing MWIPP, you should check whether the ecCodes, hdf5 and netCDF packages are installed on your system, and if not then follow sections 2.1, 2.2 and 2.3 of the User Manual in order to build them.

MWIPP is supplied in source code form. Unpack the gzipped tar file as follows:

```
tar -xzf MWIPP_v1.2_20230130.tgz
```

Then follow sections 2.4 and 2.5 of the User Manual, to configure and make the package.

7. Running the test cases

Each of the MWIPP test cases (see Table 2) comes with a 00README.txt file that describes how to run the test case and the outputs that should be generated. In most cases only minimal set-up is needed before running the supplied scripts, typically to set environment variables such as MWIPP_HOME.

8. Version control

MWIPP is maintained under Subversion at the Met Office. The version is as follows:
1.2
Last Changed Rev: 2102
Last Changed Date: 2023-01-30 14:07:21 +0000 (Mon, 30 Jan 2023)

9. User feedback

If you have suggestions for improving the software, or experience difficulties running it, please log on to the NWP SAF web site and open a ticket at https://nwp-saf.eumetsat.int/site/helpdesk/ giving the "department" as MWIPP.

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[1] https://scitools.org.uk/cartopy/docs/latest/