

Data Analysis Working Group (DA-WG) 2016-2017 report

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From the previous meeting

“The strategic goal is **to optimise/refactor RST** itself, but it would require much more effort. Currently, DA-WG is a three-men operation that includes Keith Kotyk, Kevin Sterne and me, with Evan Thomas joining the club recently. The first step is to draw a functional (block) diagram, which seems to be a formidable but doable task.”

Refactoring/optimising RST

- Evan and Simon took initiative in refurbishing VTRST3.5 into RST4.0:
 - At Simon’s request, the whole git repository was moved to a new “institution-neutral” location at <https://github.com/SuperDARN>
 - 154 commits, 35 pull requests, 115,721 additions, 4,071,847 deletions have been made by 5 contributors to the *release-4.0* branch before merging it into the main branch (*develop*)
 - The minimum quality check protocol has been enforced so that all changes have been approved by other institutions after testing on multiple Linux flavours (Kevin S, Keith, Angeline)
 - While some extra optional features were added, no principal changes to the functionality of the package have been made – those were left for RST4.1
 - RST4.0 is ready to go!

Upgrades to RST Software: 4.0

Reorganization, Restructuring and Reduction

simplified directory structure
streamlined compilation (especially for systems w/o IDL)
removed ROS software (-> OSWG?)
removed compiler generated files (125 MB -> 10 MB)

Library

Adding features but renaming so old routines can still be used

AACGM-v2

more accurate, valid 1990-2020; described at 2014 SD Workshop; Shepherd, S.G. *JGR* 2014

MLT-v2

described at 2016 SD Workshop (different from python)

IGRF-v2

read IGRF data files, added many *geopack* routines



Upgrades to RST Software: 4.1

Gridding

discussed by Evan "What's in a grid file?"

geolocation

Chisham virtual height model added to *rpos* (C and IDL)

filtering

slant range filter options

bug fixes

geodetic coordinates, channels, etc.

Map Potential Adding capabilities

*-v2

use *-old_aacgm* for old AACGM software, etc.

CS10,TS17

adding new statistical models

add_imf

add V_{sw} , dipole tilt, OMNI (coming)

Plotting

grid_plot and *map_plot*

*-v2

adding v2 library capability

default

more sensible defaults



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FITACF2.5 (still in RST4.0)

- Fixing bugs in stereo Tx-overlap that prevented processing multichannel non-stereo data (an exciting CSI story!)
- Minor bug fixes

FITACF3

- Final adjustments by Pasha and Keith
 - A more accurate noise calculation procedure has been developed and implemented
 - Elevation is calculated directly from lag 0 cross-phase – it shows noticeably lower fluctuations than the one from fitting
 - A single streamlined procedure for finding Tx-overlap samples in both mono and stereo data has been developed and implemented
 - An issue with phase “unwrapping” producing spurious high velocity values has been identified and effectively resolved
 - Ready to go!

Thanks a lot to the Team!