My VARstat plotting

These plots are based on those that Katie's scripts generated, but it is adapated to run for more instruments. Also, standard deviation plots are produced. The plots are generated from the 'stats.html' files output from the trials. The location of these files needs to be supplied for it to run. If a large selection of satellite-instruments are selected for plotting, and the trial periods are long, it can take quite a long time to read-in all the information. However, there is an option to save read-in data, so that generating plots is much quicker if you wish to keep re-running it as your trial progresses. Also, alot of plots are produced so I linked mine to my /data/local.

To use the VARstat code...
At the command line enter...

```
my_version=8.1
cd /data/local/$USER
fcm ls fcm:varstats_tr@vn$my_version
fcm co fcm:varstats_tr@vn$my_version VARSTATS-$my_version
cd VARSTATS-$my_version
my_setup_file=$PWD/setupfiles/my_setup_dat.py
run_varstats.sh $my_setup_file
```

This should run the example and produce a html page of results (from the example files in the datafiles/vastats directory). The location of the html file that displays the plots is indicated in the second to last line of output, e.g. Plots are output:
`file:////data/local/$USER/VARSTATS-8.1/plotsdir/cntrlexample1_rose_experexample2_rose_glu_i0_l1_S0_E-1_var/varstatplots_example2_rose_wrt_example1_rose.html .`
So the plots can be viewed using firefox. e.g.
`firefox file:////data/local/frab/VARSTATS-8.0/plotsdir/cntrlexample1_rose_experexample2_rose_glu_i0_l1_S0_E-1_var/varstatplots_example2_rose_wrt_example1_rose.html .`

If you wish to **run with your own data**, then **edit the "setup"** file, `setupfiles/my_setup_dat.py` and execute as above ie. `run_varstats.sh $my_setup_file`
The information in the setup file describes how to set it up essentially list the satellite-instruments you wish to generate plots for, provide the control and experiment information and then execute the script (hopefully it is fairly obvious how to set it up).
If you wish to **add a new satellite-instrument**, make changes akin to VARSTATS:changeset 962. To check the statistics are read-in correctly, edit script `src/varstats/getstats/SatInstVarstats.py` (at *"Test file of own choice"*) to accept one of your *stats.html* then execute the script.
Note: Alot of plots may be produced so I needed to link my "mainoutdir" and "mainplotdir" to my /data/local *(I copied the directory containing the plots to a public location afterwards.)*

To run on **cron**...

```
00 07 * * *  my_version=8.1 && dir=/data/local/$USER/VARSTATS-$my_version && my_setup_file=$dir/setupfiles/my_setup_dat.py && $dir/run_varstats.sh $my_setup_file
```

The Code
The code is now stored in the 'SA Utilities' repository at fcm:varstats (so you can now create your own branch if you wish to).
Please don't commit any changes back to the trunk without checking with me first.

*** Extra Notes ***
(see `fcm keyword-print fcm:varstats` for version information)

VARSTATS-8.1:
A message is printed in html output if non-selected/plotted channels contain values other than zero.
Experid information is now correct in tabulated data.
(22/12/2015)

VARSTATS-8.0:
IR and MW instrument channels are ordered by temperature, humidity, imager; and according to peak of weighting functions/Jacobians

(04/12/2015)

VARSTATS-7.1:
Will run UKV VAR statistics.
Added amsr_gcomw1, saphir_mt and aod_aqua. Added 'PS37_baseline' and 'PS37_UKV_baseline' options for specifying sat-instruments.
Now use run_varstats.sh with --satinstidlist option to list the available satellite-instruments.
Channel order of MW humidity sounding channels are set in order w.f. peak in, surf -> upwards.
Setupfile will now accept 'O-B' and 'O-A' options and uses 'example_baseline' by default, and fixed bug in O-A iteration.
(13/11/2015)

VARSTATS-7.0:
Varstats is now executed using run_varstats.sh script; avoids exporting the PYTHONPATH.
(22/09/2015)

VARSTATS-6.3:
User date selection fixed if data is not available in selected period.
GPSRO_ground corrected to GPS_ground.
(28/05/2015)

VARSTATS-6.2:
Will plot VAR stats from SODUI.
(14/04/2015)

VARSTATS-6.1:
Added instruments 'mwhs2_fy3c' and 'mwts2_fy3c'.
(11/03/2015)

VARSTATS-6.0:
Channel times-series plots can be produced (note: plotting is limited to single sat-instr at a time).
Added instruments 'in3ds_insat3d' and 'ssmis_f19'.
Added PS_baseline satinstr selections (if available).
Fix to errorbars, rmserror = sqrt(std/sqrtcounts) to rmserror = std/sqrt(counts)
Default screening threshold changed from 2 std.dev to 3 std.dev
(09/03/2015)

VARSTATS-5.4:
Runs rose files generated using cylc <= v6. (i.e. files like 'job/glu_var_anal_n108.2013070618.1.stats' or 'job/2013070618/glu_var_anal_n108/01/job.stats')
(17/12/2014)

VARSTATS-5.3:
Stabilised html. Browser no longer crashes.
(22/10/2014)

VARSTATS-5.2:
Added option to select list of satellite-instrument used in 'PS34_baseline' trials (satinstidlist = ['PS34_baseline']).
(04/08/2014)

VARSTATS-5.1:
Adding ability to read OPS stats files generated from rose-stem tasks.
(16/07/2014)

VARSTATS-5.0:

Added option for analysing OPS SR bias stats (primarily for OPS bias updates).
Setup files, e.g. 'my_setup_dat.py' are now located in the 'setupfiles' directory.
Added 'mviricl_metsat7'. Added a few other improvements - for details see fcm commit log.
(03/07/2014)

VARSTATS-4.0:
Faster code. Runs Rose files and SCS files. A few extra user options - plot selected dates and runtime preferences.
(07/01/2014)

VARSTATS-3.0:
Runs Rose files.
(04/09/2013)

VARSTATS-2.1:
Adding in correction to plot titles as plots are labeled as 'O-B' statistics regardless of 'whichloop' run is selected.
(04/09/2013)

VARSTATS-2.0:
- Ability to analyse differing set of VAR statistics (from differing VAR runs) has been added - just set the `whichloop` variable in the `my_setup_file.py` file.
NB: Output plot directories are now labelled as: cntrl*_exper*_i*_l* An additional example file with two sets of vAR statistics has been added (for the control only). Set 'whichloop = 2' to run this example. - Additionally, 'sonde_rh' can be analysed.
(15/08/2013)

VARSTATS-1.0:
Code is now stored at svn://fcm7/SAUtils_svn/VARSTATS .
(07/08/2013)

r481_varstats_plotting_fortwiki:
Includes option to process more than one exper-cntrl trial pair, improved plotting options (plots can be displayed in interactive mode), option to output results in tabulated form, default is now screening ON and plots now labelled with 'screening outliers' option that was used.
(22/07/2013)

r299_varstats_plotting_fortwiki2 :
Identical to "r299_varstats_plotting_fortwiki", but fix for IASI penalties, ob counts rms, and thus std.dev values is included. Plot titiles have been edited ('bias' -> O-B).
(04/06/2013)

r299_varstats_plotting_fortwiki :
The screening of outliers is turned OFF by default in this version, rather than on as I described in html help. (This was whilst debating whether to have the default ON or OFF).
To switch screening ON on simply edit file: `$my_varstat_folder/src/varstats/plotting/generate_varstat_plots.py, line 69: screenoutliers=True`
(In the future the screening will be ON be default, and will be an option that can be set).
(26/03/2013)

-- AnnaBooton - 22 Jul 2013