Utility programs and scripts

M. A. Floyd

Massachusetts Institute of Technology, Cambridge, MA, USA

GPS Data Processing and Analysis with GAMIT/GLOBK and `track`
Addis Ababa University, Ethiopia
24–25 & 27–29 November 2017

http://geoweb.mit.edu/~floyd/courses/gg/201711_AAU/

Outline

- Organizing/pre-processing
- Part of `sh_gamit`
- Evaluating results
- Visualization

Guide to scripts

- There are many scripts in the ~/gg/com directory and we recommend you look at all these scripts over time because they often contain useful guides as to how to do certain tasks
  - Look at the programs used in the scripts because these show you the sequences and inputs needed for different tasks
  - Scripting methods are useful when you want to automate tasks or allow easy re-generation of results to your own specifications
  - Look for templates that show how different tasks can be accomplished
- ~/gg/kf/utils/ and ~/gg/gamit/utils/ contain programs invoked by the scripts in ~/gg/com/ or run directly from a command line.
- Both the shell scripts and the utility programs are self-documenting, invoked by typing the name without any arguments

GAMIT/GLOBK utilities

Organization/Pre-processing

- `sh_get_times`: List start/stop times for all RINEX files
- `sh_upd_stnfo`: Add entries to station.info from RINEX headers
- `doy`: Convert between DOY, YYMMDD, JD, MJD, GPSW
- `convertc`: Transform coordinates (Cartesian/geodetic/spherical)
- `glist`: List sites for h-files in gdl-file, check coordinates and models
- `cortran/convertc`: Translate coordinate types and file formats
- `corcom`: Rotate an apr-file to a different plate frame
- `unify_apr`: Set equal velocities/coordinates for `glorg` equates
- `glist2cmd`: Create a "use_site" list from a `glist` summary file
- `vel2stab`: Create a "stab_site" list from a velocity org-file
- `sh_dos2unix`: Remove the extra CR from each line of a file

GAMIT/GLOBK utilities

Scripts used by `sh_gamit` but also useful as stand-alone

- `sh_get_rinex`: ftp a RINEX "o" file from remote archives (see ftp_info)
- `sh_crx2rnx`: convert to/from RINEX/Hatanaka
- `sh_get_nav`: ftp a RINEX "n" file from remote archives
- `sh_get_met`: ftp a RINEX "m" file from remote archives
- `sh_get_ionex`: ftp a RINEX "i" (IONEX) file
- `sh_get_hfiles`: ftp h-files from MIT/SOPAC
- `sh_update_eop`: ftp an EOP file from IERS, create pmu, ut1., wob.
- `sh_get_orbits`: ftp a g-file or SP3 file from remote archives
- `sh_sp3fit`: create a g- or t-file from an SP3 file (1–3 days)
  - Called by `sh_get_orbits`

GAMIT/GLOBK utilities

Evaluating results
- `sh_oneway`: Plot phase residuals (sky map; vs elevation) [GMT]
- `sh_plotelmean`: Elevation angles average residuals plots [GMT]
- `cview`: Display and manipulate phase residuals [X-windows]
- `sh_plot_pos`: Plot coordinate times series [GMT]
- `sh_tshist`: Plot histogram of time-series statistics [GMT]
- `tsview`: Display and manipulate coordinate time series [MATLAB]
- `sh_plotvel`: Plot velocity maps [GMT]
- `sh_map_elements`, `sh_map_calif`, `sh_map_balkans`, etc. [GMT]
- `velview`: Display and manipulate velocity maps [MATLAB]
- `sh_velhist`: Plot histogram of velocity statistics
- `sh_org2vel`: Extract plate-referenced velocities from `glorg` print file
- `tscon`: Rotate ".pos"-files into new reference frame rather than rerun `glred`/`glorg`
- `velrot`: Combine velocity fields from different analyses

tscon to redefine reference frame

- apr-file for your chosen reference frame may be specified in `glorg` command file

- But if we want to put time series in different reference frames without rerunning `glred`, we can use `tscon`

- `tscon` works in much the same way as `glorg` and has a command file that uses a few `globk/glorg` options
  - `tscon` will not be able to use the full covariance matrix (with inter-site spatial correlations) that is available to `glorg`
  - Remember to read in as many pos-files as possible so that as many stabilization sites as possible are available! You cannot rotate only one time series because the (network) stabilization is done in the same way as `glorg`

sh_plot_track

- Reads track "NEU", "DHU" or "XYZ" output file

- May add subplot to view evolution of atmospheric delay
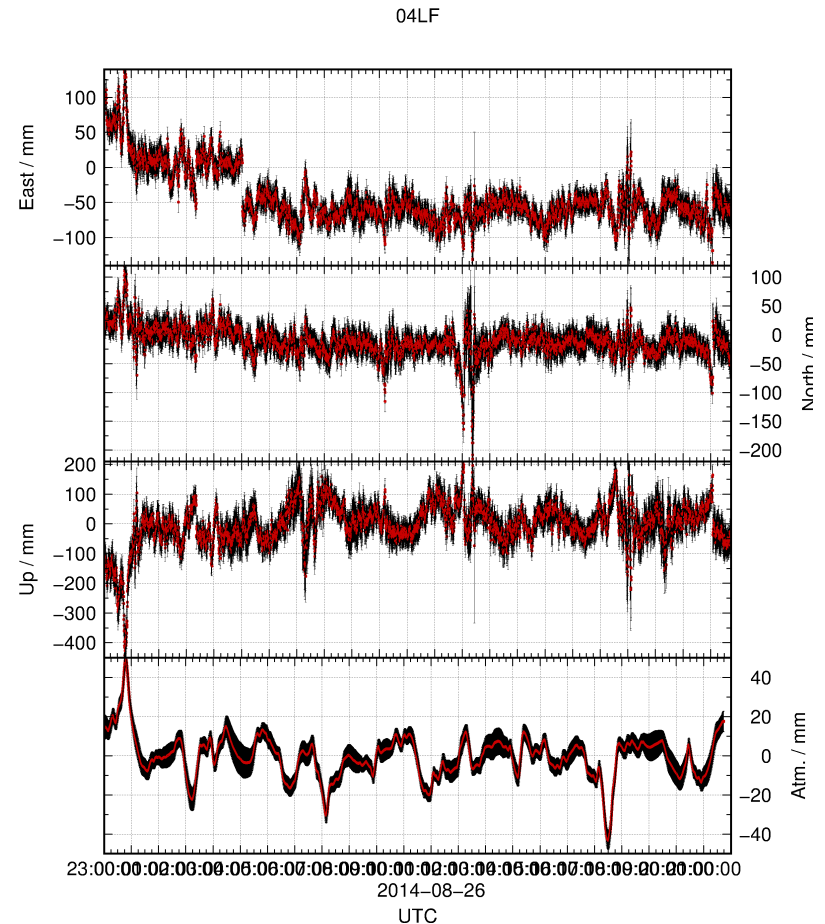
sh_kml

- Script for converting several formats of result into KML format for viewing in Google Earth
  - `glist` (may also be used with time slider)
  - ".org"-file / ".vel"-file
  - `track` "GEOD"-format output file