Fifteen Years of Acoustic Data from MDI

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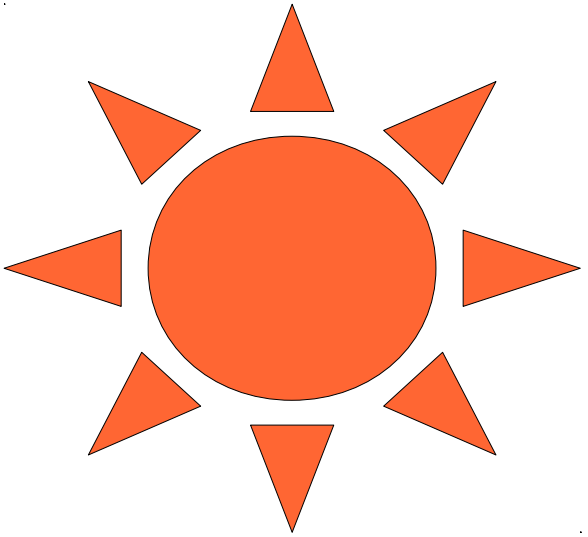

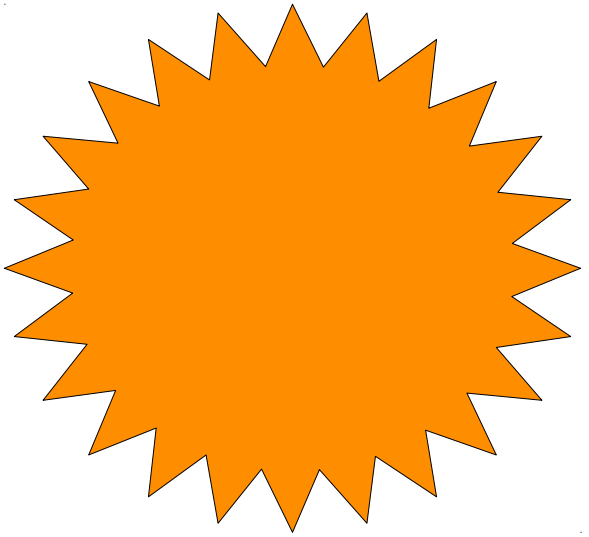

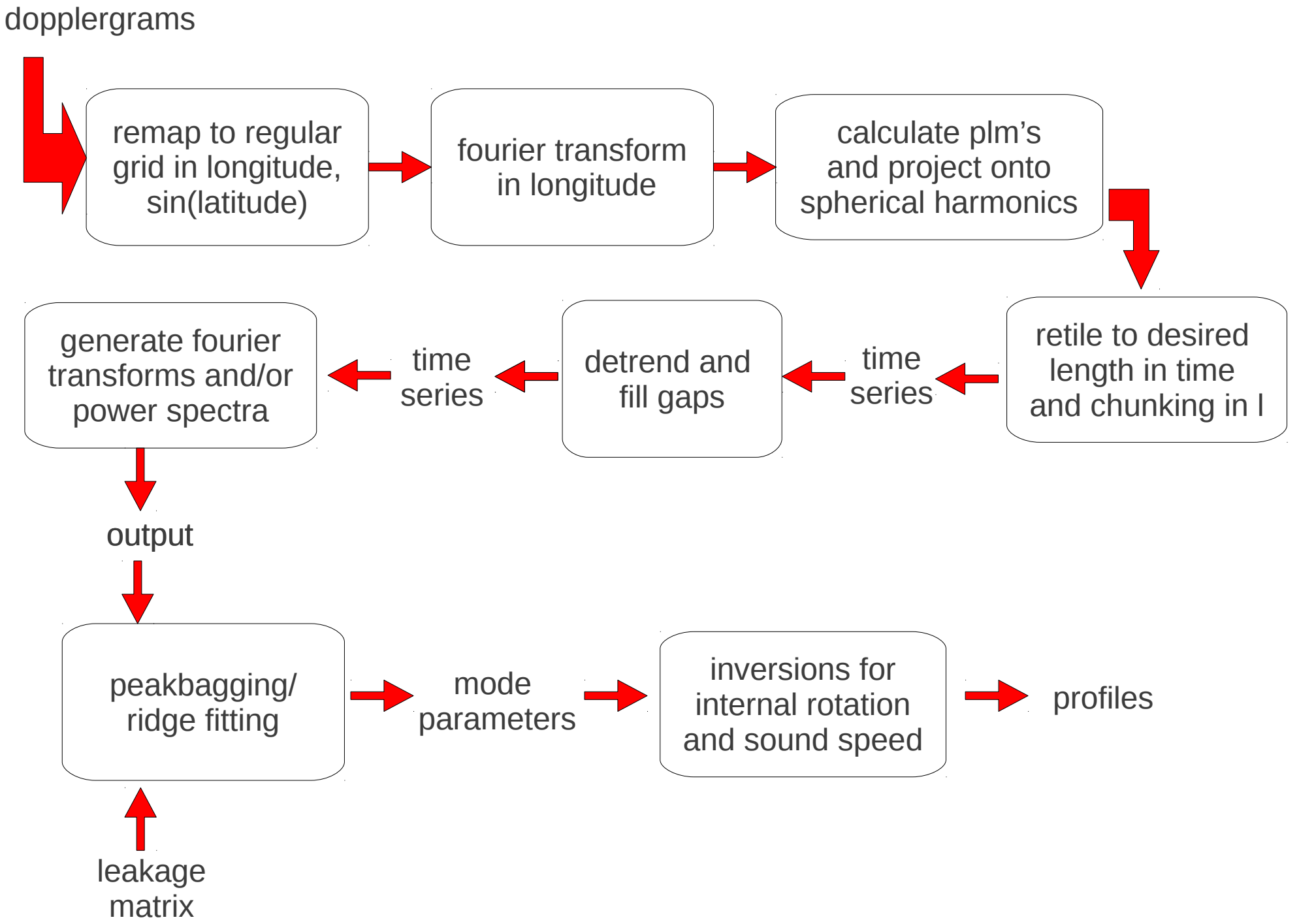
dopplergrams
remap to regular grid in longitude, sin(latitude)
fourier transform in longitude
calculate plm's and project onto spherical harmonics
retile to desired length in time and chunking in l
time series
detrend and fill gaps
time series
generate fourier transforms and/or power spectra
output
peakbagging/ ridge fitting
leakage matrix
mode parameters
inversions for internal rotation and sound speed
profiles

Dataseries

mdi.vw_V_sht_72d

mdi.vw_V_sht_secs

mdi.vw_V_sht_gaps_72d

mdi.vw_V_sht_gf_72d

mdi.vw_V_sht_gf_gaps_72d

mdi.vw_V_sht_gf_gaps_retile

mdi.vw_V_sht_pow

mdi.vw_V_modes

mdi.vw_V_modes_asym

Keywords

T_START – the beginning of the time interval a record corresponds to. This will always be the first primekey of these dataseries. It can be specified as a date string or as an offset from the MDI epoch 1993.01.01_TAI.

LMIN – minimum spherical harmonic degree represented.

LMAX – maximum spherical harmonic degree represented.

NDT – number of time points represented.

T_STEP – length of a time step in seconds, usually a constant. The length of the timeseries is then NDT times T_STEP.

T_STOP – the beginning of the following timeseries, or T_START + NDT * T_STEP.

T_OBS – the midpoint of a timeseries as given by (T_START + T_STOP) / 2.

VERSION – string describing the version of the data, updated whenever reprocessing occurs, useful for recovering obsolete versions of records.

LMIN and LMAX will be the second and third primekeys when applicable.
NDT will be the last primekey when applicable.

Sonification

What I've tried so far...

- Use mode parameters to filter data in frequency domain, inverse transform, take real part.
- Speed up by a factor of 60000 (arbitrary), 72 days → ~100 seconds,
  3 mHz →180 Hz
- Implies sample rate of 1 kHz, turns out most audio players refuse to play this.
- Shift filtered fft's down by a factor of 8, inverse transform, sample at 8 kHz, same frequency content plays in ~13 seconds.
- Use SoX (Sound eXchange) utility to mix, change sample rate and tempo as needed.