

SHBundle

spherical harmonic synthesis/analysis until very high degree/order

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<http://www.gis.uni-stuttgart.de/research/projects/bundles/>



Short Bundle History

The bundle was started in the year 1994 by Nico Sneeuw. After several additions, it was distributed to a few researchers who added some of their own functions. However, the individual development from this point onward resulted in different versions of the bundle.

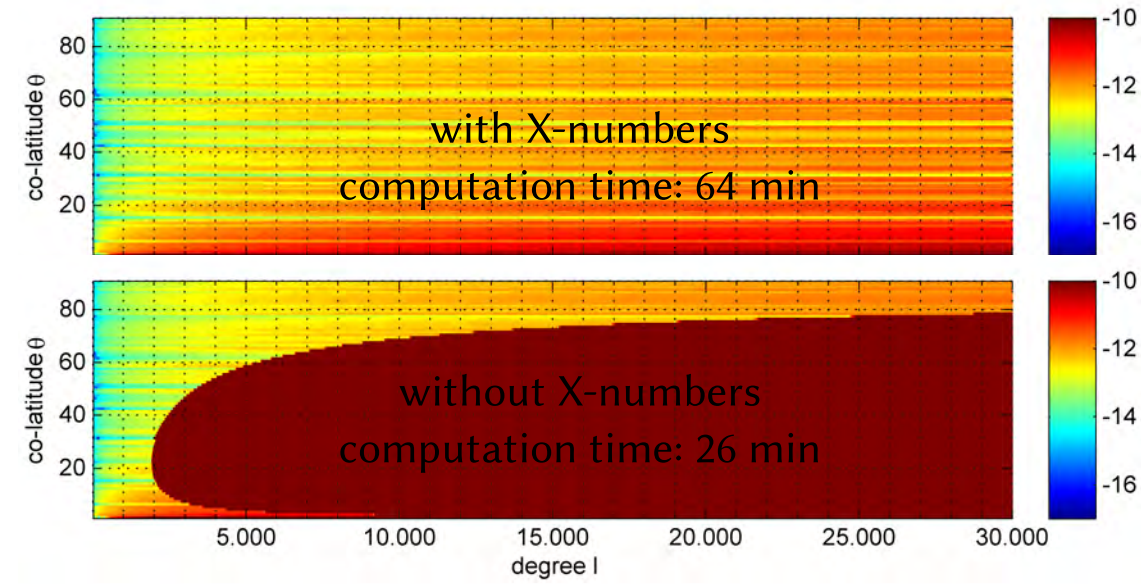
In 2014 we decided to combine the different versions again, using the source code management system git which helps us to track changes:

- we moved non-SH-functions to other bundles (uberall, visBundle),
- removed doublets (still keeping some for compatibility reasons),
- merged similar functions and
- enhanced the bundle by adding new functions.

Legendre functions

X-number' stabilized (stable until very high degree/order)

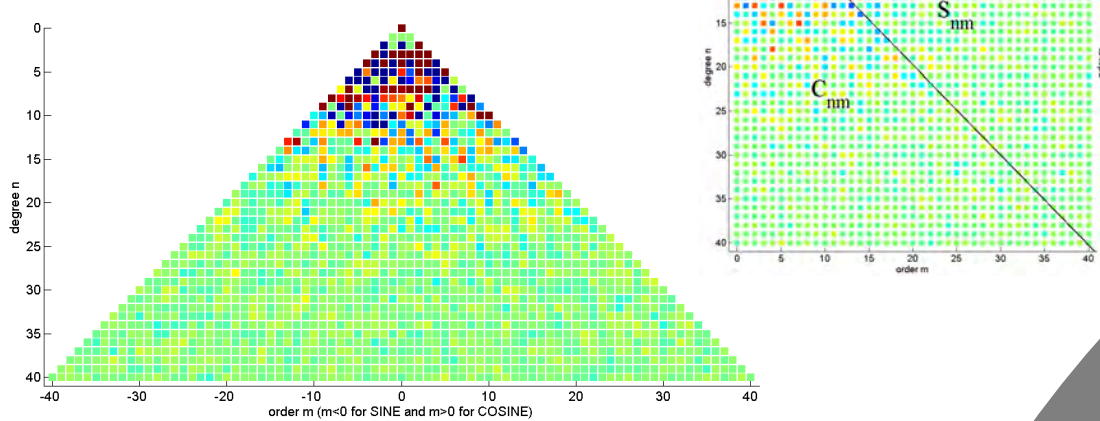
test of addition theorem:



¹ Fukushima T (2012). "Numerical computation of spherical harmonics of arbitrary degree and order by extending exponent of floating point numbers". Journal of Geodesy 86.4, 271-285. doi: 10.1007/s00190-011-0519-2.

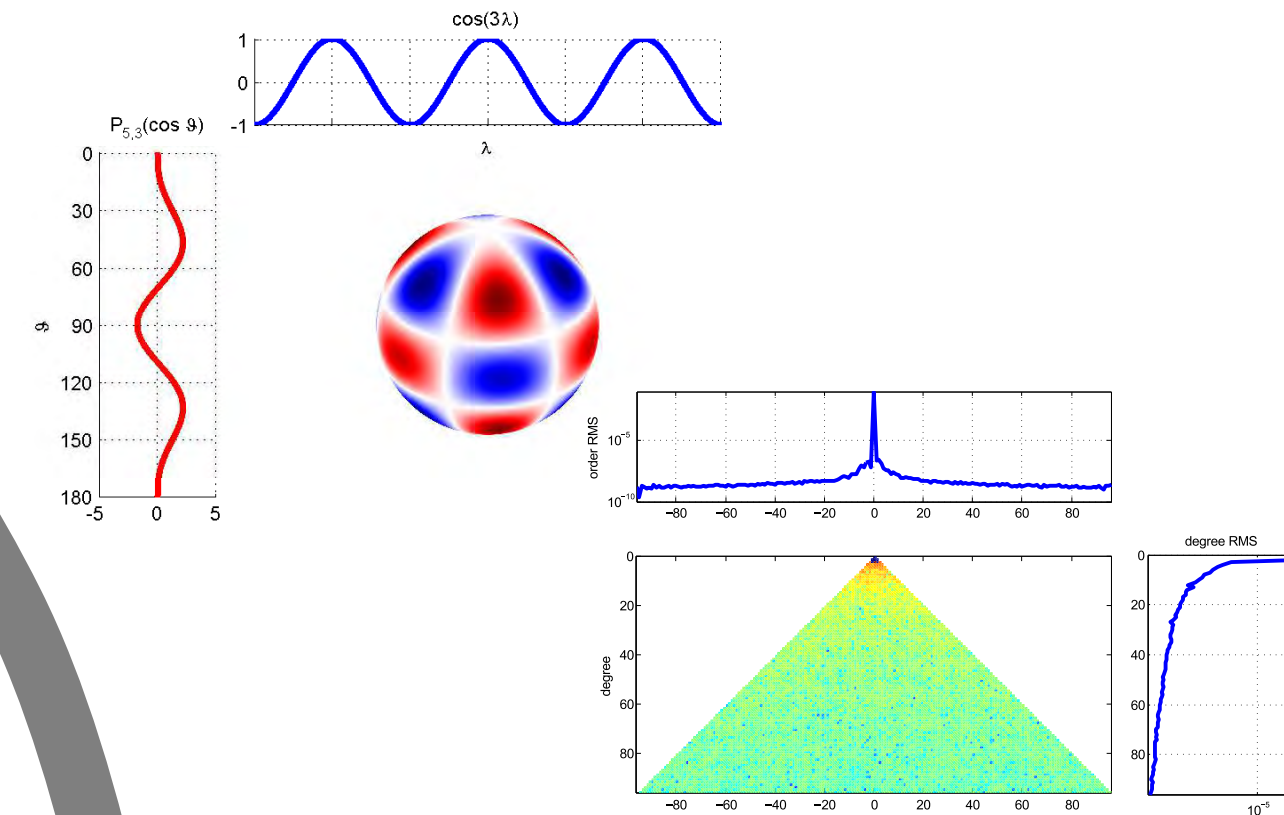
SH coefficients

- storage format (|C|S|, /S|C|) & conversions
- parser for ICGEM format
- complex SH coefficients



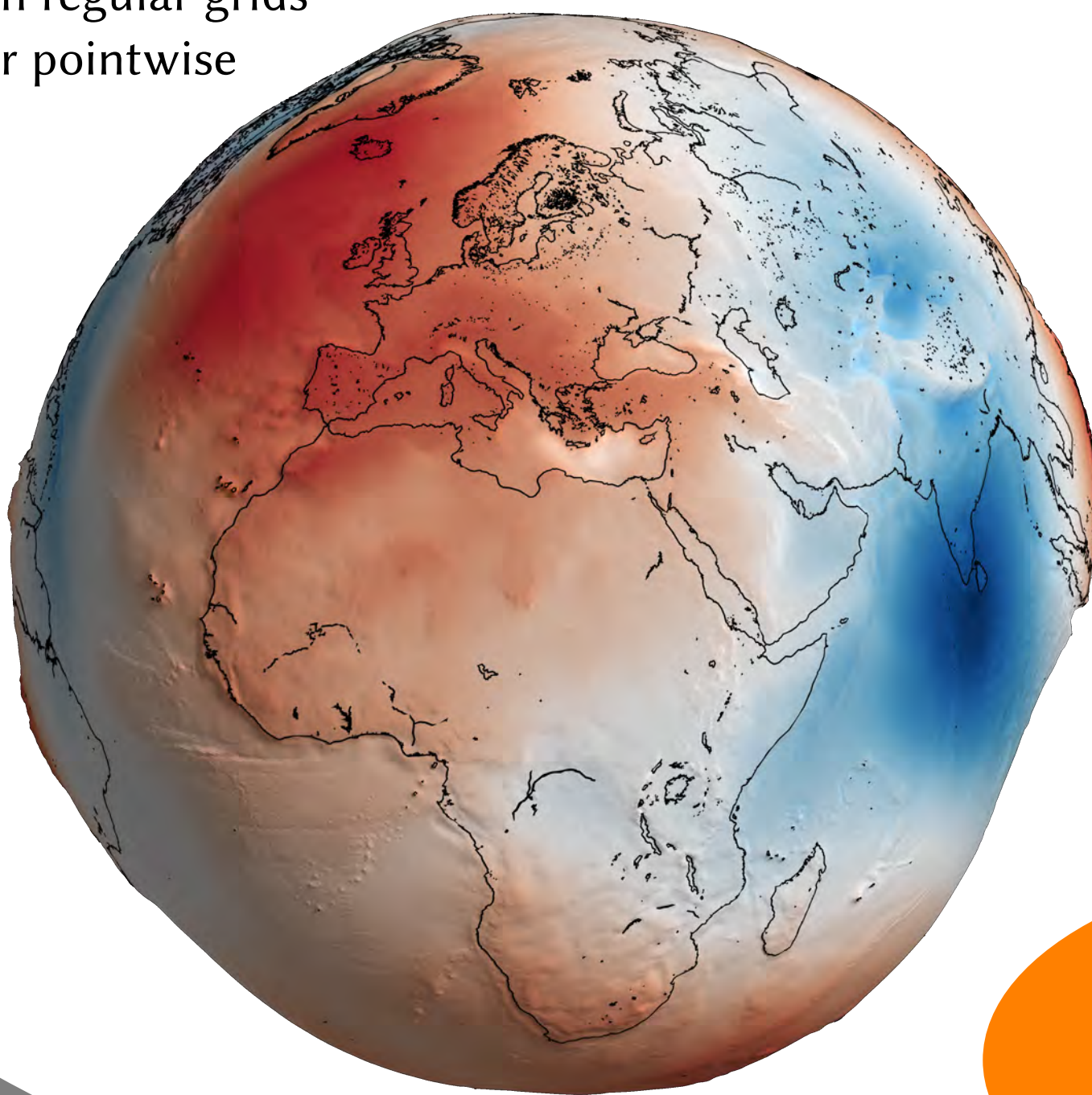
SHBundle

SH visualization



SH synthesis & analysis

on regular grids
or pointwise



twaitbar

fast, text-based
waitbar

uberall

getopt

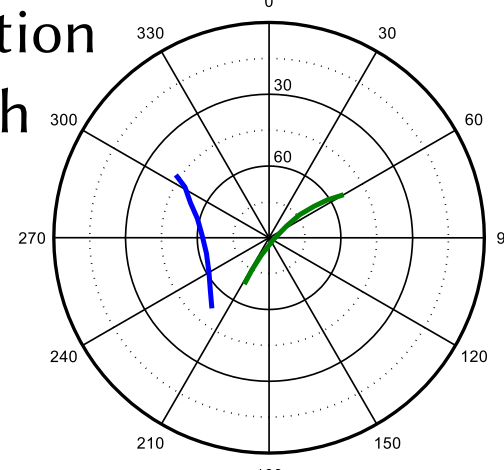
parameter input in
quantity-value style,
allows to define
default parameters

multmat/multmatvec

multiplies two matrices (or a matrix and a vector),
where each line represents a rotation matrix
or a point at a certain time

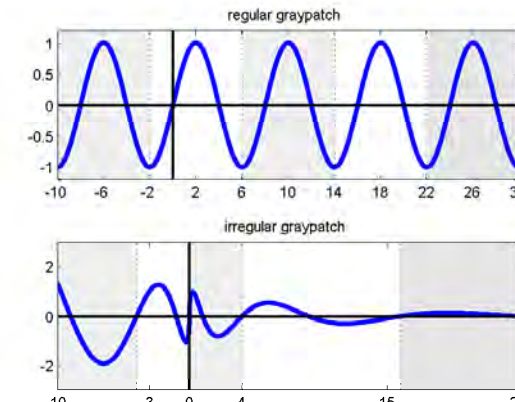
skyplot

polar coordinate plot
using elevation
and azimuth



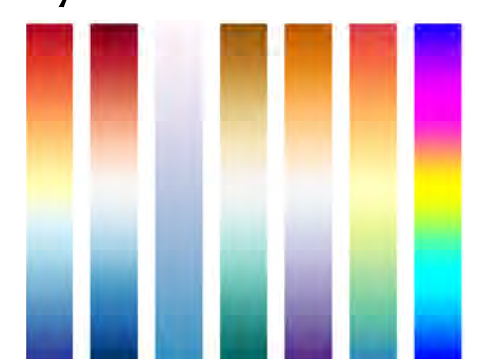
graypatch

highlight periodic events



colbrew

generate different colormaps:
e. g. colour-blind friendly,
specify min-mid-max values



bubble_voronoi

Voronoi diagram with
radius restricted cells

