

Source code distribution of Eterna 3.40 (GPL)

T. Forbriger, H. Wziontek, E. Schroth, W. Zürn

Black Forest Observatory (BFO),
Federal Agency for Cartography and Geodesy (BKG),
Karlsruhe Institute of Technology (KIT)

BLACK FOREST OBSERVATORY (BFO)

```
#####          #####          #####          #####          ##          ##          #####
##              ##              ##              ##          ##          ##          ##          ##
##              ##              ##              ##          ##          ##          ##          ##
#####          ##              #####          #####          ##          ##          ##          ##
##              ##              ##              ##          ##          ##          ##          ##
##              ##              ##              ##          ##          ##          ##          ##
#####          ##              #####          ##          ##          ##          ##          ##
```

Prof. Dr.-Ing. H.-G. Wenzel
Black Forest Observatory

Preview

Source code distribution of Eterna 3.40 (GPL)

Eterna: The Earth tide data processing package

Eterna 3.40 by Hans-Georg Wenzel

Frequently Asked Questions (FAQ)

Public online distributions and ports of Eterna

Original source code published by IGETS

Original source code published by EAS

PreAnalyze by André Gebauer

Klaus Schüller's version published by BKG

PyGTide, a Python version by Gabriel Rau

R port of Eterna

Beyond Eterna

IAG initiative for open source software

Publishing Eterna with GPL license

Plans made

Inherent conflict

Summary

Eterna 3.40 by Hans-Georg Wenzel

```
Terminal - thof@patty~/git/Eterna/doc
File Edit View Terminal Tabs Help

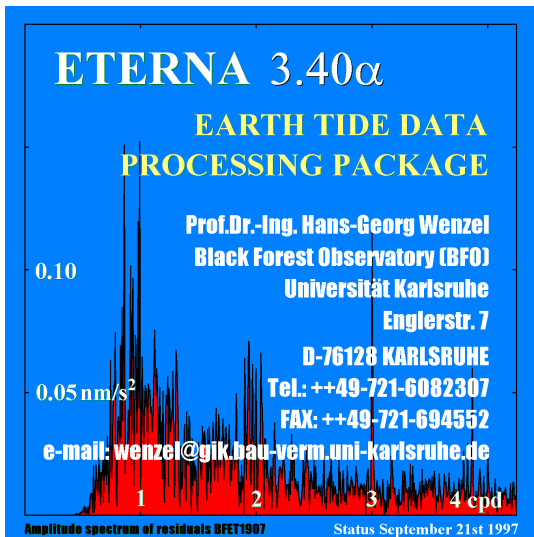
File : ETERNA34.HLP, Status 1997.09.21 4746 records

#####          #####          #####          ##          ##          ###
##             ##             ##             ##          ##          ##          ##
##             ##             ##             ##          ##          ##          ##
#####          ##             #####          ##          ##          ##          ##
##             ##             ##             ##          ##          ##          ##
##             ##             ##             ##          ##          ##          ##
#####          ##             #####          ##          ##          ##          ##

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e-mail  : wenzel@gik.bau-verm.uni-karlsruhe.de

*****
*
*   EARTH TIDE DATA PROCESSING PACKAGE ETERNA
*
*
*   Version 3.40
*
*
*   Manual ETERNA34.HLP
*
*****

eterna34.hlp lines 1-32/4746 1%
```



Making Eterna available

Hans-Georg Wenzel

- published binary executables for MS-DOS only together with tidal catalogs and data examples
- never intended to publish source code

We aim to

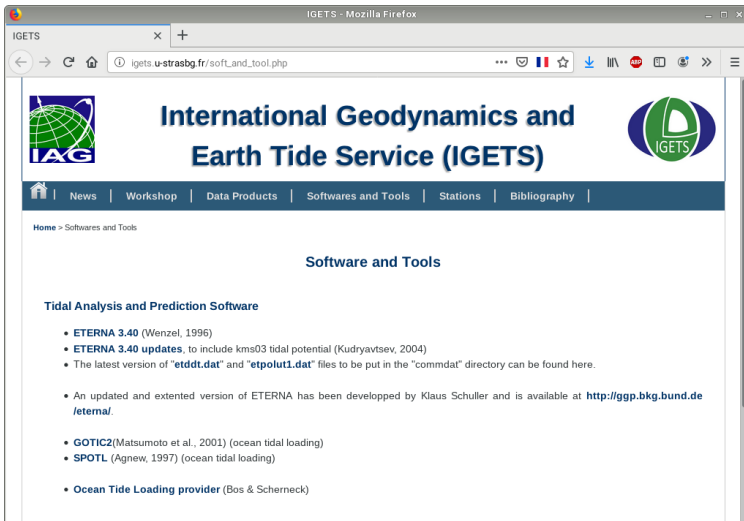
- publish source code
- in a version controlled source code repository
- under GNU General Public License (GPL)
- with the consent of Marion Wenzel
- at KIT (successor of University of Karlsruhe)

Frequently Asked Questions (FAQ)

- Why open-source?
 - Keep software running on new platforms
 - Migrate software to other environments
 - Advance software, improve, and extend
- Why a license and copyright statement?
 - Give clear account of copyright holder and ownership
 - Provide clear statement of permission to copy, modify and distribute (primarily relevant for future users)
 - Mandatory for public online distribution
- Why version control?
 - Give proper credit to original authors
 - Do not blame the wrong one for errors introduced later
 - Strengthen source code reliability
 - Support community efforts

Original source code published by IGETS


IGETS office at EOST (Strasbourg, France)




IGETS - Mozilla Firefox

IGETS

igets.u-strasbg.fr/soft_and_tool.php



International Geodynamics and Earth Tide Service (IGETS)



Home | News | Workshop | Data Products | Softwares and Tools | Stations | Bibliography

Home > Softwares and Tools

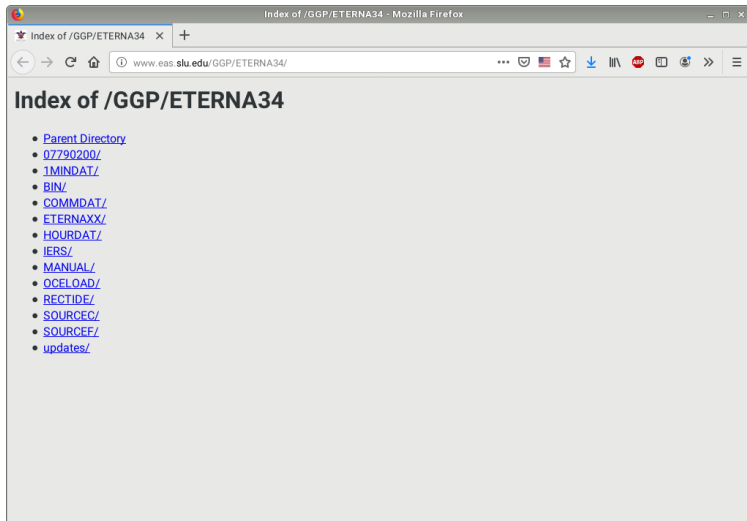
Software and Tools

Tidal Analysis and Prediction Software

- **ETERNA 3.40** (Wenzel, 1996)
- **ETERNA 3.40 updates**, to include kms03 tidal potential (Kudryavtsev, 2004)
- The latest version of "**etddt.dat**" and "**etpolut1.dat**" files to be put in the "commdat" directory can be found here.
- An updated and extended version of ETERNA has been developed by Klaus Schuller and is available at <http://ggp.bkg.bund.de/eterna/>.
- **GOTIC2**(Matsumoto et al., 2001) (ocean tidal loading)
- **SPOTL** (Agnew, 1997) (ocean tidal loading)
- **Ocean Tide Loading provider** (Bos & Scherneck)

Original source code published by EAS

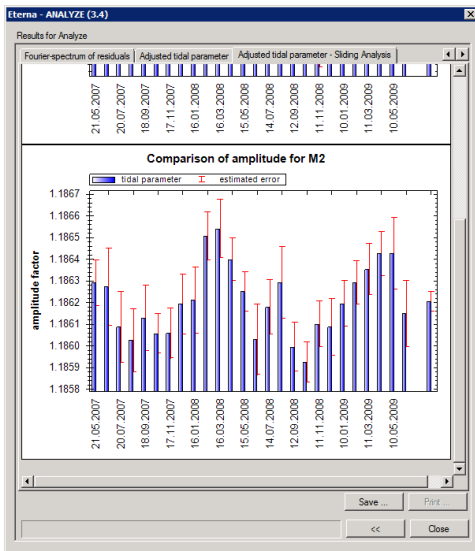
Earth & Atmospheric Sciences at Saint Louis University

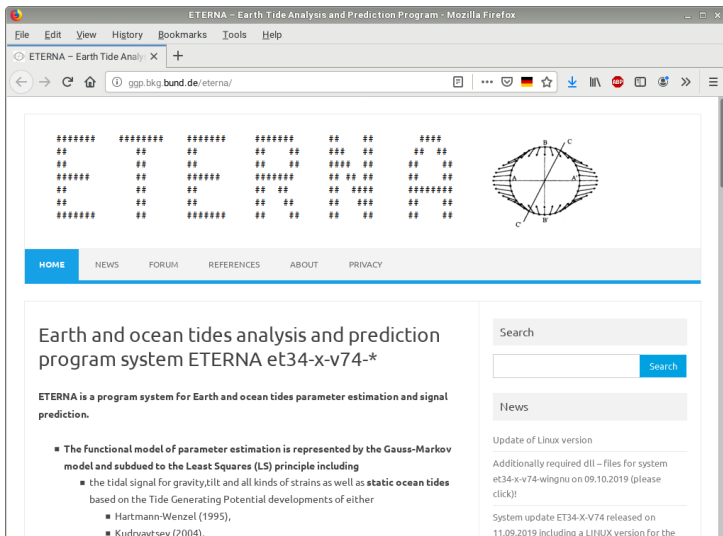


Index of /GGP/ETERNA34 - Mozilla Firefox

Index of /GGP/ETERNA34

- [Parent Directory](#)
- [07790200/](#)
- [1MINDAT/](#)
- [BIN/](#)
- [COMMDAT/](#)
- [ETERNAXX/](#)
- [HOURDAT/](#)
- [IERS/](#)
- [MANUAL/](#)
- [OCELOAD/](#)
- [RECTIDE/](#)
- [SOURCEC/](#)
- [SOURCECF/](#)
- [updates/](#)





ETERNA - Earth Tide Analysis and Prediction Program - Mozilla Firefox

File Edit View History Bookmarks Tools Help

ETERNA - Earth Tide Analy X +

gpp.bkg.bund.de/eterna/

##

HOME NEWS FORUM REFERENCES ABOUT PRIVACY

Earth and ocean tides analysis and prediction program system ETERNA et34-x-v74-*

ETERNA is a program system for Earth and ocean tides parameter estimation and signal prediction.

- The functional model of parameter estimation is represented by the Gauss-Markov model and subdued to the Least Squares (LS) principle including
 - the tidal signal for gravity, tilt and all kinds of strains as well as static ocean tides based on the Tide Generating Potential developments of either
 - Hartmann-Wenzel (1995),
 - Kudrjavnitsv (2004).

Search

Search

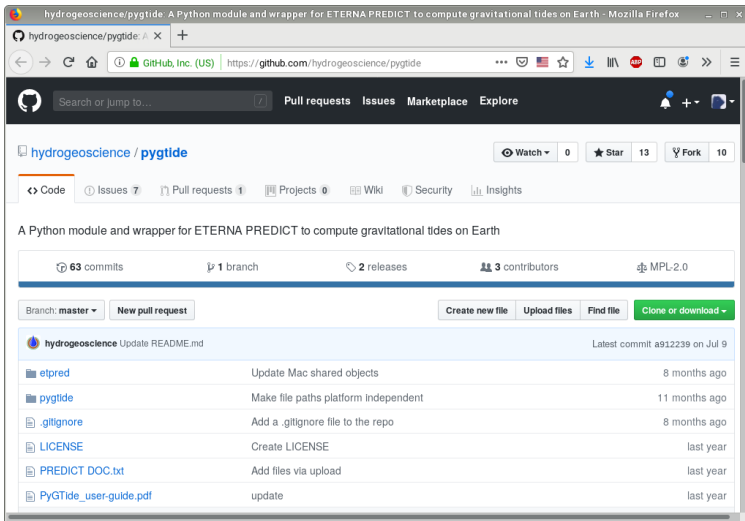
News

Update of Linux version

Additionally required dll - files for system et34-x-v74-wingnu on 09.10.2019 (please click!)

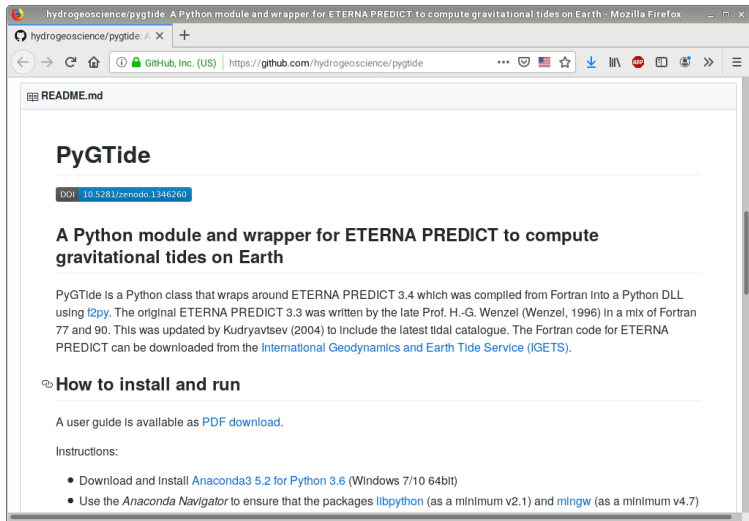
System update ET34-X-V74 released on 11.09.2019 including a LINUX version for the

PyGTide, a Python version by Gabriel Rau



The screenshot shows the GitHub repository page for `hydrogeoscience/pygtide`. The repository description is "A Python module and wrapper for ETERNA PREDICT to compute gravitational tides on Earth". The repository statistics show 63 commits, 1 branch, 2 releases, 3 contributors, and an MPL-2.0 license. The repository is on the `master` branch. The file list includes:

File	Description	Last Commit
<code>etpred</code>	Update Mac shared objects	8 months ago
<code>pygtide</code>	Make file paths platform independent	11 months ago
<code>.gitignore</code>	Add a .gitignore file to the repo	8 months ago
<code>LICENSE</code>	Create LICENSE	last year
<code>PREDICT DOC.txt</code>	Add files via upload	last year
<code>PyGTide_user-guide.pdf</code>	update	last year



hydrogeoscience/pygtide: A Python module and wrapper for ETERNA PREDICT to compute gravitational tides on Earth - Mozilla Firefox

hydrogeoscience/pygtide: A X +

https://github.com/hydrogeoscience/pygtide

PyGTide

DOI: [10.5281/zenodo.1346260](https://doi.org/10.5281/zenodo.1346260)

A Python module and wrapper for ETERNA PREDICT to compute gravitational tides on Earth

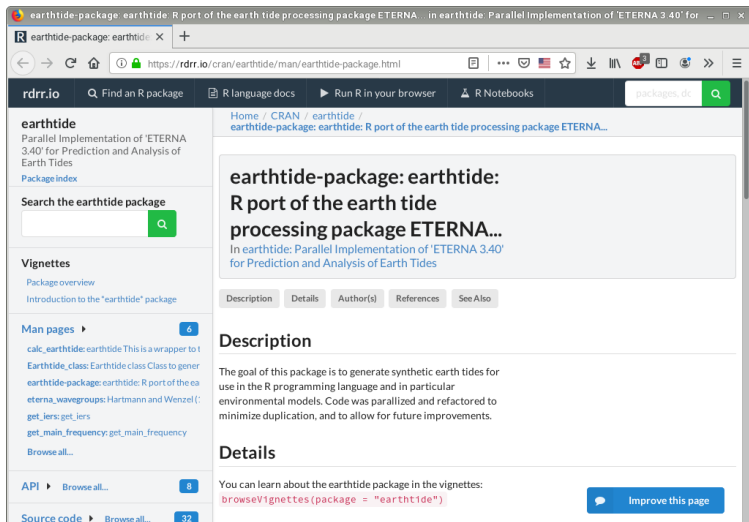
PyGTide is a Python class that wraps around ETERNA PREDICT 3.4 which was compiled from Fortran into a Python DLL using `f2py`. The original ETERNA PREDICT 3.3 was written by the late Prof. H.-G. Wenzel (Wenzel, 1996) in a mix of Fortran 77 and 90. This was updated by Kudryavtsev (2004) to include the latest tidal catalogue. The Fortran code for ETERNA PREDICT can be downloaded from the [International Geodynamics and Earth Tide Service \(IGETS\)](#).

How to install and run

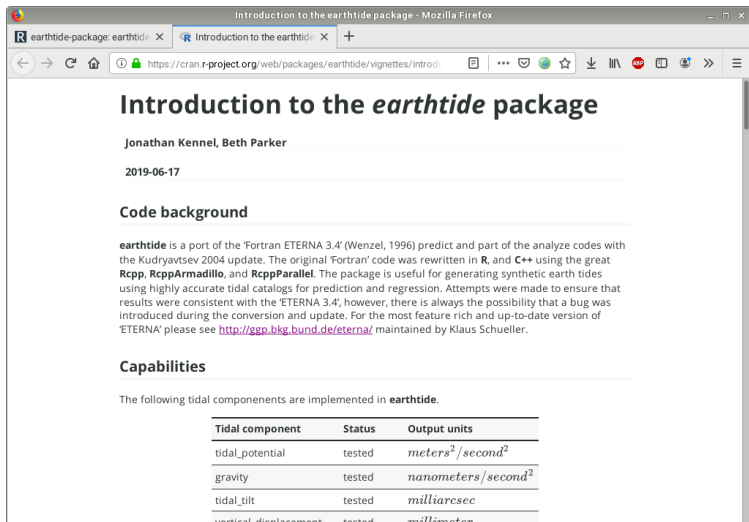
A user guide is available as [PDF download](#).

Instructions:

- Download and Install [Anaconda3 5.2 for Python 3.6](#) (Windows 7/10 64bit)
- Use the *Anaconda Navigator* to ensure that the packages [libpython](#) (as a minimum v2.1) and [mingw](#) (as a minimum v4.7)



The screenshot shows the CRAN page for the `earthtide` package. The browser address bar shows `https://rdrr.io/cran/earthtide/man/earthtide-package.html`. The page title is "earthtide: R port of the earth tide processing package ETERNA...". The main heading is "earthtide-package: earthtide: R port of the earth tide processing package ETERNA...". Below the heading, it says "In earthtide: Parallel Implementation of 'ETERNA 3.40' for Prediction and Analysis of Earth Tides". There are tabs for "Description", "Details", "Author(s)", "References", and "See Also". The "Description" tab is active, showing the text: "The goal of this package is to generate synthetic earth tides for use in the R programming language and in particular environmental models. Code was parallelized and refactored to minimize duplication, and to allow for future improvements." There is also a "Details" section with the text: "You can learn about the earthtide package in the vignettes: `browseVignettes(package = 'earthtide')`".



Introduction to the *earthtide* package

Jonathan Kennel, Beth Parker

2019-06-17

Code background

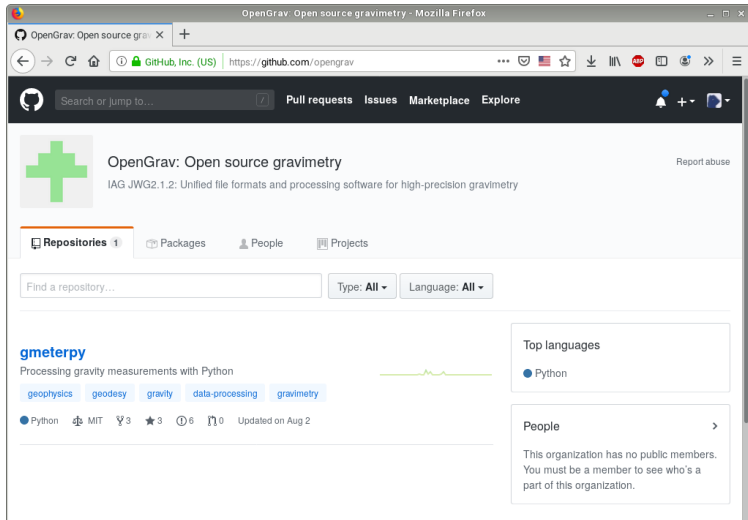
earthtide is a port of the 'Fortran ETERNA 3.4' (Wenzel, 1996) predict and part of the analyze codes with the Kudryavtsev 2004 update. The original 'Fortran' code was rewritten in **R**, and **C++** using the great **Rcpp**, **RcppArmadillo**, and **RcppParallel**. The package is useful for generating synthetic earth tides using highly accurate tidal catalogs for prediction and regression. Attempts were made to ensure that results were consistent with the 'ETERNA 3.4', however, there is always the possibility that a bug was introduced during the conversion and update. For the most feature rich and up-to-date version of 'ETERNA' please see <http://ggp.bkg.bund.de/eterna/> maintained by Klaus Schueller.

Capabilities

The following tidal components are implemented in **earthtide**.

Tidal component	Status	Output units
tidal_potential	tested	<i>meters²/second²</i>
gravity	tested	<i>nanometers/second²</i>
tidal_tilt	tested	<i>milliarcsec</i>
vertical_displacement	tested	<i>millimeter</i>

IAG initiative for open source software



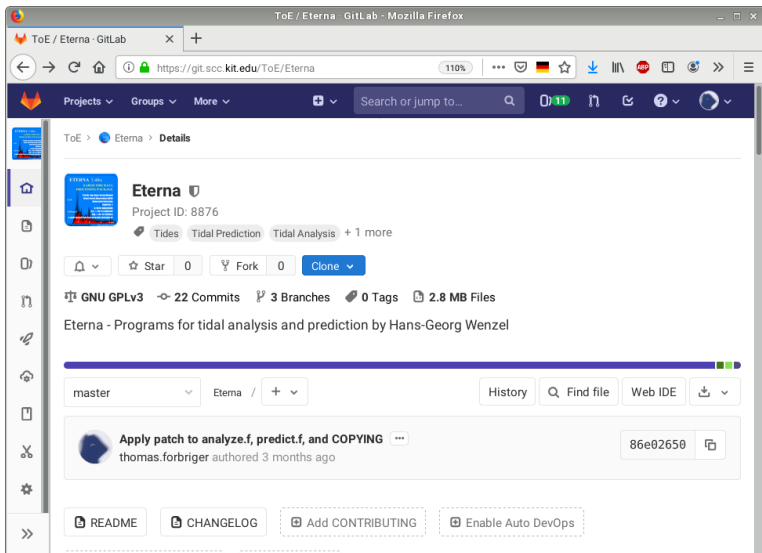
The screenshot shows a web browser window displaying the GitHub repository page for "OpenGrav: Open source gravimetry". The browser's address bar shows the URL "https://github.com/opengrav". The repository page features a green cross logo, the repository name, and a description: "IAG JWG2.1.2: Unified file formats and processing software for high-precision gravimetry". Below the repository information, there are tabs for "Repositories 1", "Packages", "People", and "Projects". A search bar is present with the text "Find a repository...". The repository "gmetry" is highlighted, with a description "Processing gravity measurements with Python" and tags for "geophysics", "geodesy", "gravity", "data-processing", and "gravimetry". The repository is written in Python, has 3 forks, 3 stars, 6 issues, and 0 pull requests, and was updated on Aug 2. On the right side, there are sections for "Top languages" (Python) and "People" (This organization has no public members).

We aim to

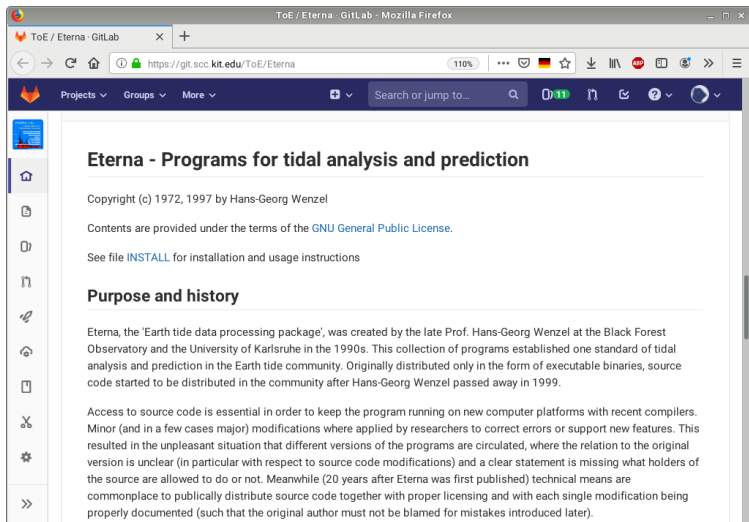
- publish Eterna 3.40 and predecessors
- apply GNU General Public License
- focus on `analyze.f`, `predict.f`, and `iers.f`
- provide contents of `commdat`
- provide selected examples of data and configuration
- provide `Makefile` for immediate compilation on Linux
- provide auxiliary programs and documentation to support users
- use `git`, make code history transparent, and publish on gitlab at KIT

We continue with advertisement. . .

Gitlab repository at KIT



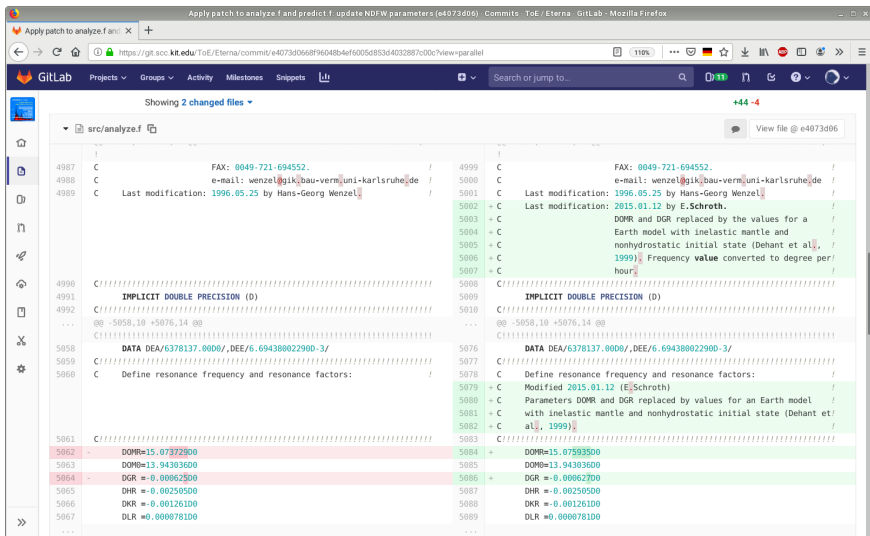
The screenshot shows a Mozilla Firefox browser window displaying the GitLab repository page for 'Eterna' at the URL `https://git.scc.kit.edu/ToE/Eterna`. The page header includes navigation options like 'Projects', 'Groups', and 'More', along with a search bar and utility icons. The main content area shows the repository details for 'Eterna', including its Project ID (8876), tags (Tides, Tidal Prediction, Tidal Analysis, etc.), and statistics (0 stars, 0 forks, 22 commits, 3 branches, 0 tags, 2.8 MB files). The license is GNU GPLv3. A commit by thomas.forbriger is highlighted, with a patch to analyze.f, predict.f, and COPYING. The bottom of the page features buttons for README, CHANGELOG, Add CONTRIBUTING, and Enable Auto DevOps.



The screenshot shows a Mozilla Firefox browser window with the address bar displaying `https://git.soc.kit.edu/ToE/Eterna`. The page title is "Eterna - Programs for tidal analysis and prediction". The content includes:

- Copyright (c) 1972, 1997 by Hans-Georg Wenzel
- Contents are provided under the terms of the [GNU General Public License](#).
- See file [INSTALL](#) for installation and usage instructions
- Purpose and history**
- Eterna, the 'Earth tide data processing package', was created by the late Prof. Hans-Georg Wenzel at the Black Forest Observatory and the University of Karlsruhe in the 1990s. This collection of programs established one standard of tidal analysis and prediction in the Earth tide community. Originally distributed only in the form of executable binaries, source code started to be distributed in the community after Hans-Georg Wenzel passed away in 1999.
- Access to source code is essential in order to keep the program running on new computer platforms with recent compilers. Minor (and in a few cases major) modifications were applied by researchers to correct errors or support new features. This resulted in the unpleasant situation that different versions of the programs are circulated, where the relation to the original version is unclear (in particular with respect to source code modifications) and a clear statement is missing what holders of the source are allowed to do or not. Meanwhile (20 years after Eterna was first published) technical means are commonplace to publically distribute source code together with proper licensing and with each single modification being properly documented (such that the original author must not be blamed for mistakes introduced later).

Synoptic diffs



Apply patch to analyze.f and predict.f: update NDFW parameters (e4073d06) : Commits · ToE / Eterna : GitLab - Mozilla Firefox

https://git.scc.kit.edu/ToE/Eterna/commit/e4073d0668f960484ef6005d853d4032887c0c?view=parallel

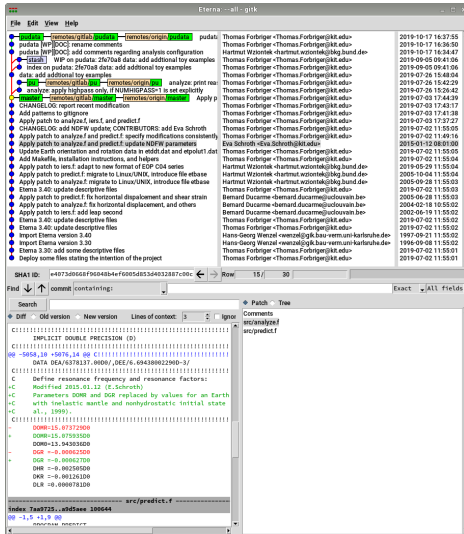
GitLab Projects Groups Activity Milestones Snippets LLI Search or jump to...

Showing 2 changed files +44 -4

src/analyze.f

Line	Change	Old Code	New Code
4987	C	FAX: 0049-721-694552.	FAX: 0049-721-694552.
4988	C	e-mail: wenzel@gik.bau-verm.uni-karlsruhe.de	e-mail: wenzel@gik.bau-verm.uni-karlsruhe.de
4989	C	Last modification: 1996.05.25 by Hans-Georg Wenzel	Last modification: 1996.05.25 by Hans-Georg Wenzel
5002	+		Last modification: 2015.01.12 by E.Schroth.
5003	+		DOMR and DGR replaced by the values for a
5004	+		Earth model with inelastic mantle and
5005	+		nonhydrostatic initial state (Dehant et al.,
5006	+		1999). Frequency value converted to degree per
5007	+		hour.
4990	C	////////////////////////////////////	5008 C////////////////////////////////////
4991	C	IMPLICIT DOUBLE PRECISION (D)	5009 C IMPLICIT DOUBLE PRECISION (D)
4992	C	////////////////////////////////////	5010 C////////////////////////////////////
...		@@ -5058,10 +5076,14 @@	... @@ -5058,10 +5076,14 @@
5058	C	DATA DEA/6378137.0000/,DEE/6.694380022900-3/	5076 C DATA DEA/6378137.0000/,DEE/6.694380022900-3/
5059	C	////////////////////////////////////	5077 C////////////////////////////////////
5060	C	Define resonance frequency and resonance factors:	5078 C Define resonance frequency and resonance factors:
5061	C	////////////////////////////////////	5083 C////////////////////////////////////
5062	-	DOMR=15.07372900	5084 + DOMR=15.07593500
5063	-	DOM0=13.94303600	5085 + DOM0=13.94303600
5064	-	DGR =-0.00062500	5086 + DGR =-0.00062700
5065	-	DHR =-0.00250500	5087 + DHR =-0.00250500
5066	-	DKR =-0.00126100	5088 + DKR =-0.00126100
5067	-	DLR =0.000078100	5089 + DLR =0.000078100

Example of GUI tool for git: gitk



The screenshot shows the gitk GUI with the following components:

- Commit History:** A list of commits with columns for commit hash, author, date, and message. The selected commit is 4073d068f96048b4e690548c546932887c0dc.
- Search and Filter:** A search bar with the text "command containing:" and a dropdown menu set to "Exact".
- Diff View:** A view of the selected commit's changes to the file "src/predict.f". The diff shows several lines of code being added (+) and removed (-).

```
commit 4073d068f96048b4e690548c546932887c0dc | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-10-17 16:37:55
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-10-17 16:34:47
commit 1911d0cc1 | Hartmut Wziontek <hartmut.wziontek@bkg.bund.de> | 2019-09-05 09:41:06
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-09-05 09:41:06
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-26 15:48:04
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-26 15:42:29
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-26 15:26:42
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-23 17:44:19
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-23 17:43:17
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-23 17:41:38
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-23 17:37:27
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-22 11:55:05
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-22 11:49:16
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-22 11:55:05
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-22 11:55:05
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-22 11:55:04
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-22 11:55:04
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-22 11:55:03
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-22 11:55:03
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-22 11:55:02
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-22 11:55:01
commit 1911d0cc1 | Thomas Forbriger <Thomas.Forbriger@kit.edu> | 2019-07-22 11:55:01
```

SHA1 ID: 4073d068f96048b4e690548c546932887c0dc | Row: 15 / 30

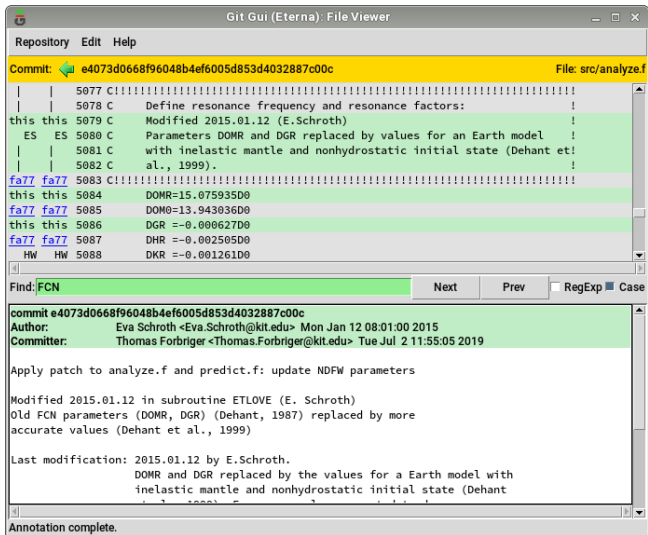
Find: [command containing:] [Exact] [All fields]

Search [] [Patch] [Tree]

Diff [] [Old version] [New version] Lines of context: 3 [] [Ignore]

```
.....
IMPLICIT DOUBLE PRECISION (D)
.....
-0604.18 +0676.14 00 C
DATA DEA/6378137.0000/,DEE/6.694380022900-3/
.....
C
C Define resonance frequency and resonance factors:
C Modified 2015.01.12 (E.Schroth)
+C Parameters D0NR and DGR replaced by values for an Earth
+C with inelastic mantle and nonhydrostatic initial state
+C al., 1995)
.....
- D0NR=-15.87372900
+ D0NR=-15.07533500
- D0M=-13.94303600
+ DGR =-0.00625000
- DGR =-0.00627000
DNR =-0.00260000
DNR =-0.00126100
DLR =-0.000078100
.....
Index: src/predict.f
@@ -1,5 +1,9 @@
```

Example of GUI tool for git: git gui



Repository Edit Help

Commit: ◀ e4073d0668f96048b4ef6005d853d4032887c00c File: src/analyze.f

```

| | 5077 C|!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
| | 5078 C Define resonance frequency and resonance factors: |
this this 5079 C Modified 2015.01.12 (E.Schroth) |
ES ES 5080 C Parameters DMR and DGR replaced by values for an Earth model |
| | 5081 C with inelastic mantle and nonhydrostatic initial state (Dehant et!
| | 5082 C al., 1999).
fa77 fa77 5083 C|!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
this this 5084 DOMR=15.075935D0
fa77 fa77 5085 DOM0=13.943036D0
this this 5086 DGR =-0.000627D0
fa77 fa77 5087 DHR =-0.002050D0
HW HW 5088 DKR =-0.001261D0

```

Find: FCN Next Prev RegExp Case

```

commit e4073d0668f96048b4ef6005d853d4032887c00c
Author:      Eva Schroth <Eva.Schroth@kit.edu> Mon Jan 12 08:01:00 2015
Committer:   Thomas Forbriger <Thomas.Forbriger@kit.edu> Tue Jul 2 11:55:05 2019

Apply patch to analyze.f and predict.f: update NDFW parameters

Modified 2015.01.12 in subroutine ETLOVE (E. Schroth)
Old FCN parameters (DMR, DGR) (Dehant, 1987) replaced by more
accurate values (Dehant et al., 1999)

Last modification: 2015.01.12 by E.Schroth.
           DOMR and DGR replaced by the values for a Earth model with
           inelastic mantle and nonhydrostatic initial state (Dehant
           et al., 1999)

```

Annotation complete.

git blame authors for their contributions

```
Terminal - thof@patty ~/git/Eterna
File Edit View Terminal Tabs Help
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5073) 1 0.0000D0,0.0000D0,0.0000D0,0.0000D0,0.0000D0,0.0000D0/
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5074) DATA DLATP/0.D0,0.D0,0.D0,0.D0,0.D0,0.D0,0.D0,0.D0,0.D0,0.D0,
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5075) 1 0.D0,0.D0/
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5076) DATA DLATM/0.D0,0.D0,0.D0,0.D0,0.D0,0.D0,0.D0,0.D0,0.D0,0.D0,
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5077) 1 0.D0,0.D0/
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5078) C!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5079) C Definition of parameters of Geodetic Reference System 1980. !
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5080) C DEA is major semi axis in meter. !
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5081) C DEE is square of first excentricity (without dimmension). !
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5082) C DEGM is geocentric gravitational constant in m*3/s**2. !
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5083) C!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5084) DATA DEA/6378137.00D0/,DEE/6.69438002290D-3/
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5085) C!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5086) C Define resonance frequency and resonance factors: !
e4073d06 (Eva Schroth 2015-01-12 08:01:00 +0100 5087) C Modified 2015.01.12 (E.Schroth) !
e4073d06 (Eva Schroth 2015-01-12 08:01:00 +0100 5088) C Parameters DMR and DGR replaced by values for an Earth model !
e4073d06 (Eva Schroth 2015-01-12 08:01:00 +0100 5089) C with inelastic mantle and nonhydrostatic initial state (Dehant et !
e4073d06 (Eva Schroth 2015-01-12 08:01:00 +0100 5090) C al., 1999). !
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5091) C!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
e4073d06 (Eva Schroth 2015-01-12 08:01:00 +0100 5092) DMR=15.075935D0
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5093) DOM0=13.943036D0
e4073d06 (Eva Schroth 2015-01-12 08:01:00 +0100 5094) DGR =-0.000627D0
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5095) DHR =-0.002505D0
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5096) DKR =-0.001261D0
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5097) DLR =0.0000781D0
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5098) C!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5099) C DCLAT is cos and DSLAT is sin of ellipsoidal latitude. !
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5100) C!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5101) DCLAT=DCOS(DLAT*DRAD)
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5102) DSLAT=DSIN(DLAT*DRAD)
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5103) C!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
fa774588 (Hans-Georg Wenzel 1996-09-08 11:55:02 +0200 5104) C Compute ellipsoidal curvature radius DN in meter. !
Lines 5073-5104
```

Provide log of commit messages

```
Terminal - thof@patty ~/git/Eterna
File Edit View Terminal Tabs Help
commit e4073d06668f96048b4ef6005d853d4032887c00c
Author: Eva Schroth <Eva.Schroth@kit.edu>
Date: Mon Jan 12 08:01:00 2015 +0100

Apply patch to analyze.f and predict.f: update NDFW parameters

Modified 2015.01.12 in subroutine ETLOVE (E. Schroth)
Old FCN parameters (DOMR, DGR) (Dehant, 1987) replaced by more
accurate values (Dehant et al., 1999)

Last modification: 2015.01.12 by E.Schroth.
DOMR and DGR replaced by the values for a Earth model with
inelastic mantle and nonhydrostatic initial state (Dehant
et al., 1999). Frequency value converted to degree per
hour.

Dehant, V. (1987): Tidal Parameters for an Inelastic Earth.
Physics of the Earth and Planetary Interiors, 49, 97-116,
1987.

Dehant, V., Defraigne, P. and Wahr J.M. (1999): Tides for a
convectiv Earth. Journal of Geophysical Research, vol. 104,
no. B1, 1035-1058, 1999.

commit 8df33b5c0cf421b816c58d12c76daea8ceb7f6a5
Author: Thomas Forbriger <Thomas.Forbriger@kit.edu>
Date: Tue Jul 2 11:55:05 2019 +0200

Update Earth orientation and rotation data in etddt.dat and etpolut1.dat

commit df286c6f34ead243913927f41fc00b6cb8ed4875
Author: Thomas Forbriger <Thomas.Forbriger@kit.edu>
lines 1-32
```

... end of commerial

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This is

- granted by Marion Wenzel and KIT for the original code
- granted by Bernard Ducarme and others for code advancements
- missing/impossible for third party code used by Hans-Georg Wenzel

The latter

- isn't a problem for the distribution of binary executables, however
- means that source code may only be published in modified form

- There is a need for Eterna source code to be available to the community
- Source code shall be provided with proper open source license in a git repository
- Non-open-source third-party components of the source code must be replaced prior to publication

We invite you to benefit and contribute.
Stay tuned. . .

Thanks to

- Hans-Georg Wenzel
for developing Eterna and its set of tidal catalogs
- Marion Wenzel
for supporting this initiative and giving her consent
- Gabriel Rau (KIT-AGW)
for pointing out further sources of Eterna ports

Thank you for your attention

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