

prErrWeb

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1 Todo List

Member [prSky.haveDL \(prStation oth\)](#)disabled until the (u,v,w) coordinates of the [prStation](#) are re-implemented**Member [prStation.assocMdl \(\)](#)**re-implement dependence on the u value of [prStation](#)**Member [prStation.opl \(\)](#)**

disfunctional until the components of (u,v) of the class are re-implemented

2 Module Index

2.1 Modules

Here is a list of all modules:

PrErrWeb 4

3 Hierarchical Index

3.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

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Applet	7
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Geoid	7
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4 Class Index

4.1 Class List

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midiGUI	10
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prSky	26

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prStar	29
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5 File Index

5.1 File List

Here is a list of all files with brief descriptions:

prErrWeb.java	43
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6 Module Documentation

6.1 PrErrWeb

[prErrWeb.html](#) is an HTML page which computes optical path differences for a 2-beam interferometer and corresponding differential path differences for an interferometer looking at the same time at two targets (dual-feed), as realized by PRIMA at the [VLTI](#).

Since

2005-01-24 created
2005-11-22 sign error in the use of the 18.984 Paranal rotation angle of UVWvsNE
2006-06-01 swapped the rotation angle of the baseline orientation (180 deg)
2007-08-14 added the two Keck telescopes to baseline selector

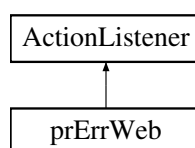
Author

Richard J. Mathar [home page www.strw.leidenuniv.nl/~mathar](http://www.strw.leidenuniv.nl/~mathar)

7 Class Documentation

7.1 ActionListener Class Reference

Inheritance diagram for ActionListener:



7.2 Angle Class Reference

Package Functions

- [Angle](#) (double radians)
- double [deg](#) ()
- double [sec](#) ()
- double [arcsec](#) ()
- double [muarcsec](#) ()

Static Package Functions

- static double [deg2rad](#) (double [deg](#))
- static double [arcsec2rad](#) (double [as](#))
- static double [rad2arcsec](#) (double [r](#))
- static double [rad2deg](#) (double [rad](#))
- static double [sec2rad](#) (double [sec](#))
- static void [sec2rad](#) ([prErrvar](#) t)
- static void [deg2rad](#) ([prErrvar](#) t)

Package Attributes

- double [rad](#)

7.2.1 Detailed Description

An angle in various units. This represents an angle in units of radians, degrees, arcseconds etc.

Author

Richard J. Mathar

7.2.2 Constructor & Destructor Documentation

7.2.2.1 `Angle.Angle (double radians)` [`package`]

Ctor.

Parameters

<i>radians</i>	the angle in units of radians
----------------	-------------------------------

7.2.3 Member Function Documentation

7.2.3.1 `double Angle.arcsec ()` [`package`]

Convert to arc seconds.

Returns

the angle in units of arc seconds. One arc second is 3600th of a degree.

7.2.3.2 `static double Angle.arcsec2rad (double as)` [`static`], [`package`]

Convert from arcseconds to radians.

Parameters

<i>as</i>	the angle in units of arc seconds.
-----------	------------------------------------

Returns

the angle in radians.

7.2.3.3 `double Angle.deg ()` [package]

Convert to degrees.

Returns

the angle in units of degrees.

7.2.3.4 `static double Angle.deg2rad (double deg)` [static],[package]

Convert from degrees to radians.

Parameters

<i>deg</i>	the angle in units of degrees.
------------	--------------------------------

Returns

the angle in radians.

7.2.3.5 `static void Angle.deg2rad (prErrvar t)` [static],[package]**7.2.3.6** `double Angle.muarcsec ()` [package]

Convert to micro arc seconds.

Returns

the angle in units of millionth of arc seconds. One arc second is 3600th of a degree.

7.2.3.7 `static double Angle.rad2arcsec (double r)` [static],[package]**7.2.3.8** `static double Angle.rad2deg (double rad)` [static],[package]**7.2.3.9** `double Angle.sec ()` [package]

Convert to time (seconds). The conversion represents a motion of constant angular velocity such that the full angle fo 360 degrees is done in 24 hours; this defines the constant of proportionality implied here.

Returns

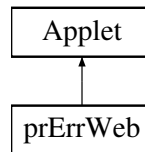
the angle in units of seconds.

7.2.3.10 `static double Angle.sec2rad (double sec)` [static],[package]**7.2.3.11** `static void Angle.sec2rad (prErrvar t)` [static],[package]**7.2.4** Member Data Documentation**7.2.4.1** `double Angle.rad` [package]

The value in units of radians.

7.3 Applet Class Reference

Inheritance diagram for Applet:



7.4 Geoid Class Reference

Package Functions

- [Geoid](#) ()
- [Geoid](#) (double finv, double radius)
- double[] [geocen](#) (double lon, double lat, double altit)
- [prErrvar](#)[] [geocen](#) ([prErrvar](#) lon, [prErrvar](#) lat, [prErrvar](#) altit)

Package Attributes

- double [f](#)
- double [eccen](#)
- double [rhoe](#)

Static Package Attributes

- static final double [IERS_TN32_FLAT](#) = 298.25642
- static final double [IERS_TN21_FLAT](#) = 298.25642
- static final double [GRS80_FLAT](#) = 298.257222101
- static final double [IERS_TN32_RHO_E](#) =6378136.6
- static final double [IERS_TN21_RHO_E](#) =6378136.49
- static final double [GRS80_RHO_E](#) =6378137.0

7.4.1 Detailed Description

A description of the Earth ellipsoid.

See Also

[MIDI optical path differences and phases.](#)

Since

2007-06-28

Author

Richard J. Mathar

7.4.2 Constructor & Destructor Documentation

7.4.2.1 Geoid.Geoid () [package]

default Ctor. The variables are set to the defaults of the WGS84.

See Also

[?]

7.4.2.2 Geoid.Geoid (double *finv*, double *radius*) [package]

Ctor.

Parameters

<i>finv</i>	the inverse flattening factor, typically 300.
<i>radius</i>	the equatorial radius in meters.

7.4.3 Member Function Documentation

7.4.3.1 double [] Geoid.geocen (double *lon*, double *lat*, double *altit*) [package]

Compute the 3 Cartesian coordinates in the geocentric system. [? ? ?]

Parameters

<i>lon</i>	geodetic longitude in radian
<i>lat</i>	geodetic latitude in radian
<i>altit</i>	height above geoid in meters

Returns

a vector of 3 cartesian coordinates, each in meters. The component 1 becomes zero for a point with longitude zero. The component 2 becomes zero for a point with latitude zero. The result refers to a system with the x axis pointing to the equator south of Greenwich, and the y axis pointing to the equator east of Greenwich, which also is the OIFITS geocentric system.

7.4.3.2 prErrvar [] Geoid.geocen (prErrvar *lon*, prErrvar *lat*, prErrvar *altit*) [package]

Compute the 3 Cartesian coordinates in the geocentric system. [? ? ?]

Parameters

<i>lon</i>	geodetic longitude in radian
<i>lat</i>	geodetic latitude in radian
<i>altit</i>	height above geoid in meters

Returns

a vector of 3 cartesian coordinates, each in meters. The component 1 becomes zero for a point with longitude zero. The component 2 becomes zero for a point with latitude zero. The result refers to a system with the x axis pointing to the equator south of Greenwich, and the y axis pointing to the equator east of Greenwich, which also is the OIFITS geocentric system.

7.4.4 Member Data Documentation

7.4.4.1 `double Geoid.eccen` [package]

Eccentricity. The relation to `Geoid.f` is $e^2 = f(2 - f)$.

7.4.4.2 `double Geoid.f` [package]

Flattening factor. This is normally close to 1/298.26.

7.4.4.3 `final double Geoid.GRS80_FLAT = 298.257222101` [static], [package]

The inverse flattening factor of the GRS80 model.

See Also

[?]

7.4.4.4 `final double Geoid.GRS80_RHO_E = 6378137.0` [static], [package]

Equatorial radius of the GRS 1980 system, meters.

See Also

[?]

7.4.4.5 `final double Geoid.IERS_TN21_FLAT = 298.25642` [static], [package]

The inverse flattening factor of the IERS 1996 convention.

See Also

Table 4.1 in [?]

7.4.4.6 `final double Geoid.IERS_TN21_RHO_E = 6378136.49` [static], [package]

Equatorial radius of the IERS 1996 convention, meters.

See Also

Table 4.1 of [?]

7.4.4.7 `final double Geoid.IERS_TN32_FLAT = 298.25642` [static], [package]

The inverse flattening factor of the IERS 2003 convention.

See Also

[?]

7.4.4.8 `final double Geoid.IERS_TN32_RHO_E = 6378136.6` [static], [package]

Equatorial radius of the IERS 2003 convention, meters.

See Also

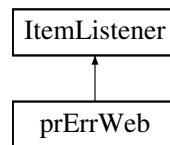
[?]

7.4.4.9 `double Geoid.rhoe` [package]

Equatorial radius in meters. Typically 6378137.

7.5 ItemListener Class Reference

Inheritance diagram for ItemListener:



7.6 midi Class Reference

Package Functions

- [midi](#) ()
- double [North](#) (final [prSky](#) obs)
- double [East](#) (final [prSky](#) obs)
- double [pbla](#) (final [prSky](#) obsT1, final [prSky](#) obsT2)
- void [applyP](#) (final double pang, final double toP, final double toperpP, double xy[], final double scal)

7.6.1 Detailed Description

Author

Richard J. Mathar

7.6.2 Constructor & Destructor Documentation

7.6.2.1 [midi.midi](#) () [package]

7.6.3 Member Function Documentation

7.6.3.1 void [midi.applyP](#) (final double *pang*, final double *toP*, final double *toperpP*, double *xy*[], final double *scal*) [package]

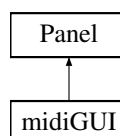
7.6.3.2 double [midi.East](#) (final [prSky](#) *obs*) [package]

7.6.3.3 double [midi.North](#) (final [prSky](#) *obs*) [package]

7.6.3.4 double [midi.pbla](#) (final [prSky](#) *obsT1*, final [prSky](#) *obsT2*) [package]

7.7 midiGUI Class Reference

Inheritance diagram for midiGUI:



Public Member Functions

- [midiGUI](#) (Color fg, Color bg)
- void [refre](#) ([prSky](#) pst1, [prSky](#) pst2, [prSky](#) sst1, [prSky](#) sst2)

Package Functions

- void [as2Canv](#) (final double zoom, double asx, double asy, int xy[], Canvas [c](#))
- void [starCross](#) (final int x, final int y, Graphics [gr](#))
- void [pgrid](#) (Canvas [c](#), final double zoom, String typ)

Package Attributes

- [midi mid](#)
- Graphics [gr](#)
- Canvas [c](#)
- Label [mid_L](#)
- double [M_SQRT_2](#)
- double [fov](#)
- TextField [zoom_T](#)
- Label [zoom_L](#)
- TextField [Dgrid_T](#)
- Label [Dgrid_L](#)
- Choice [pixGrid](#)
- Color [pixGridCol](#)
- Color [DgridCol](#)

Static Private Attributes

- static final long [serialVersionUID](#) = 20080424

7.7.1 Detailed Description

Author

Richard J. Mathar

7.7.2 Constructor & Destructor Documentation

7.7.2.1 [midiGUI.midiGUI](#) (Color *fg*, Color *bg*)

7.7.3 Member Function Documentation

7.7.3.1 void [midiGUI.as2Canv](#) (final double *zoom*, double *asx*, double *asy*, int *xy[]*, Canvas *c*) [package]

7.7.3.2 void [midiGUI.pgrid](#) (Canvas *c*, final double *zoom*, String *typ*) [package]

7.7.3.3 void [midiGUI.refre](#) (prSky *pst1*, prSky *pst2*, prSky *sst1*, prSky *sst2*)

7.7.3.4 void [midiGUI.starCross](#) (final int *x*, final int *y*, Graphics *gr*) [package]

7.7.4 Member Data Documentation

7.7.4.1 Canvas [midiGUI.c](#) [package]

7.7.4.2 Label [midiGUI.Dgrid.L](#) [package]

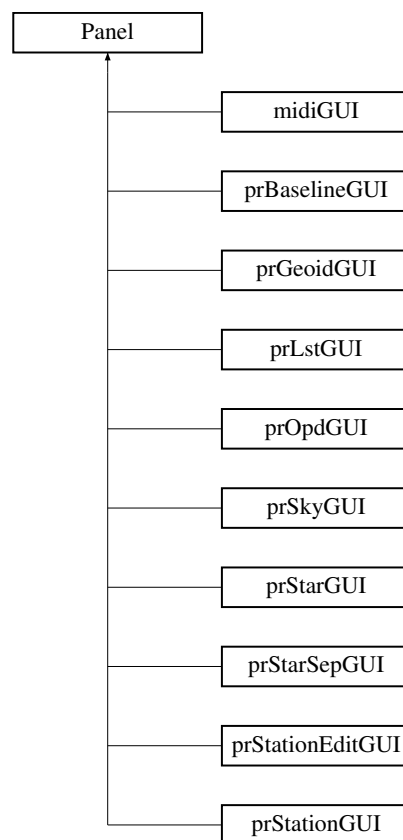
7.7.4.3 TextField [midiGUI.Dgrid.T](#) [package]

7.7.4.4 Color [midiGUI.DgridCol](#) [package]

- 7.7.4.5 `double midiGUI.fov` [package]
- 7.7.4.6 `Graphics midiGUI.gr` [package]
- 7.7.4.7 `double midiGUI.M_SQRT_2` [package]
- 7.7.4.8 `midi midiGUI.mid` [package]
- 7.7.4.9 `Label midiGUI.mid.L` [package]
- 7.7.4.10 `Choice midiGUI.pixGrid` [package]
- 7.7.4.11 `Color midiGUI.pixGridCol` [package]
- 7.7.4.12 `final long midiGUI.serialVersionUID = 20080424` [static], [private]
- 7.7.4.13 `Label midiGUI.zoom.L` [package]
- 7.7.4.14 `TextField midiGUI.zoom.T` [package]

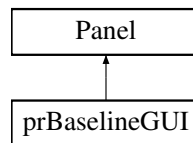
7.8 Panel Class Reference

Inheritance diagram for Panel:



7.9 prBaselineGUI Class Reference

Inheritance diagram for prBaselineGUI:



Public Member Functions

- [prBaselineGUI](#) ([prStationGUI](#) teles, Color fg, Color bg)

Package Functions

- void [rehash](#) ([prStationGUI](#) teles, [prSky](#) ps)

Package Attributes

- Label[] [Tlbl_L](#)
- TextField[][] [xyz_T](#)
- TextField [length_T](#)
- Label [length_L](#)
- [prErrvar](#) [blength](#)
- TextField [ori_T](#)
- Label [ori_L](#)
- [prErrvar](#) [ori](#)

Private Member Functions

- void [refres](#) (final [prErrvar](#)[] xyzT1, final [prErrvar](#)[] xyzT2)
- void [init](#) (Color fg, Color bg)

Static Private Attributes

- static final long [serialVersionUID](#) = 20080424

7.9.1 Detailed Description

Author

Richard J. Mathar

7.9.2 Constructor & Destructor Documentation

7.9.2.1 [prBaselineGUI.prBaselineGUI](#) ([prStationGUI](#) teles, Color fg, Color bg)

7.9.3 Member Function Documentation

7.9.3.1 void [prBaselineGUI.init](#) (Color fg, Color bg) [private]

7.9.3.2 void [prBaselineGUI.refres](#) (final [prErrvar](#)[] xyzT1, final [prErrvar](#)[] xyzT2) [private]

7.9.3.3 void [prBaselineGUI.rehash](#) ([prStationGUI](#) teles, [prSky](#) ps) [package]

7.9.4 Member Data Documentation

- 7.9.4.1 `prErrvar prBaselineGUI.blengh` [package]
- 7.9.4.2 `Label prBaselineGUI.length_L` [package]
- 7.9.4.3 `TextField prBaselineGUI.length_T` [package]
- 7.9.4.4 `prErrvar prBaselineGUI.ori` [package]
- 7.9.4.5 `Label prBaselineGUI.ori_L` [package]
- 7.9.4.6 `TextField prBaselineGUI.ori_T` [package]
- 7.9.4.7 `final long prBaselineGUI.serialVersionUID = 20080424` [static], [private]
- 7.9.4.8 `Label [] prBaselineGUI.Tlbl_L` [package]
- 7.9.4.9 `TextField [][] prBaselineGUI.xyz_T` [package]

7.10 prDL Class Reference

Package Functions

- `prDL` (int indx)
- `prDL` (int indx, final double ucoord)
- boolean `haveOPL` (final double uexcess)
- double `opl` (double fromu)

Package Attributes

- int `no`
- double `u`
- double `v`
- double[] `urange`
- boolean `isEast`

Private Member Functions

- void `init` (final int indx)

Static Private Attributes

- static double[] `vlist` = {-37.125,-37.875,-38.625,-39.375,-40.625,-41.375,-42.125,-42.875}

7.10.1 Detailed Description

A primitive placeholder for a Coude and VLTI train from the telescope to the PRIMA detector.

Author

Richard J. Mathar

7.10.2 Constructor & Destructor Documentation

7.10.2.1 `prDL.prDL (int indx)` [package]

Ctor

7.10.2.2 `prDL.prDL (int indx, final double ucoord)` [package]

Ctor with an explicit position of the MDL carriage.

7.10.3 Member Function Documentation

7.10.3.1 `boolean prDL.haveOPL (final double uexcess)` [package]

7.10.3.2 `void prDL.init (final int indx)` [private]

Construct a VLTl DL number from the station index. DL's 1,2,5 and 6 are flagged as "Eastern" delay line carriages.

Allowed ranges in the Paranal U coordinate have been obtained from `issgui/bitmaps/issguiParanalLayout.xbm` by subtraction of the carriage length from the wall position. This is +59.7 to +113 meters for the Eastern, -27 to +44 meters for the Western delay lines, kept in the two components of the variable `urange`.

All other's (that is 3, 4, 7 and 8) are "Western" delay line carriages.

7.10.3.3 `double prDL.opl (double fromu)` [package]

7.10.4 Member Data Documentation

7.10.4.1 `boolean prDL.isEast` [package]

7.10.4.2 `int prDL.no` [package]

7.10.4.3 `double prDL.u` [package]

7.10.4.4 `double [] prDL.urange` [package]

7.10.4.5 `double prDL.v` [package]

7.10.4.6 `double [] prDL.vlist = { -37.125,-37.875,-38.625,-39.375,-40.625,-41.375,-42.125,-42.875 }` [static],[private]

A list of Paranal platform V coordinates (8 of them, one per DL) is hardcoded in the `prDL::vlist` variable. Values between -37.125 m and -42.875 m.

7.11 prErr Class Reference

Static Public Member Functions

- static void `main` (String[] args)

7.11.1 Detailed Description

Author

Richard J. Mathar

7.11.2 Member Function Documentation

7.11.2.1 `static void prErr.main (String[] args)` [static]

7.12 prErrvar Class Reference

Package Functions

- `prErrvar` ()

- [prErrvar](#) (double *val*)
- [prErrvar](#) (double value, double error, int *errIndx*)
- [prErrvar](#) (double value, double[] *errvec*)
- [prErrvar](#) (String *text*, int *errIndx*)
- [prErrvar copy](#) ()
- [prErrvar plus](#) ([prErrvar](#) *rhs*)
- [prErrvar plus](#) (double *rhs*)
- [prErrvar minus](#) ()
- [prErrvar minus](#) ([prErrvar](#) *rhs*)
- [prErrvar mult](#) (double *f*)
- [prErrvar mult](#) ([prErrvar](#) *rhs*)
- [prErrvar invers](#) ()
- [prErrvar div](#) ([prErrvar](#) *rhs*)
- [prErrvar sqrt](#) ()
- [prErrvar square](#) ()
- [prErrvar sin](#) ()
- [prErrvar cos](#) ()
- [prErrvar tan](#) ()
- [prErrvar acos](#) ()
- [prErrvar atan](#) ()
- String [toText](#) ()
- String [toText](#) (boolean *debug*)
- String [toTextDeg](#) ()
- String [toTextSec](#) ()
- String [toTextas](#) (double *factor*)

Static Package Functions

- static [prErrvar negate](#) ([prErrvar](#) *rhs*)
- static [prErrvar sin](#) ([prErrvar](#) *x*)
- static [prErrvar cos](#) ([prErrvar](#) *x*)
- static [prErrvar tan](#) ([prErrvar](#) *x*)
- static [prErrvar acos](#) ([prErrvar](#) *x*)
- static [prErrvar atan](#) ([prErrvar](#) *x*)
- static [prErrvar atan2](#) ([prErrvar](#) *y*, [prErrvar](#) *x*)
- static [prErrvar hypot](#) ([prErrvar](#) *x*, [prErrvar](#) *y*)
- static [prErrvar dot](#) ([prErrvar](#)[] *lhs*, [prErrvar](#)[] *rhs*)
- static [prErrvar](#)[] [cross](#) ([prErrvar](#)[] *lhs*, [prErrvar](#)[] *rhs*)
- static void [normalize](#) ([prErrvar](#)[] *rhs*)

Package Attributes

- double *val*
- double *err*
- double[] *grads*

Static Package Attributes

- static final int [T1LO](#) =0
- static final int [T1LAT](#) =1
- static final int [T1AL](#) =2
- static final int [T2LO](#) =3
- static final int [T2LAT](#) =4
- static final int [T2AL](#) =5
- static final int [PSRA](#) =6
- static final int [PSDEC](#) =7
- static final int [SSRA](#) =8
- static final int [SSDEC](#) =9
- static final int [LST](#) =10
- static final int [N](#) =11
- static DecimalFormat [fd](#) = new DecimalFormat("0.##E0")

7.12.1 Detailed Description

Author

Richard J. Mathar

7.12.2 Constructor & Destructor Documentation

7.12.2.1 `prErrvar.prErrvar ()` [[package](#)]

7.12.2.2 `prErrvar.prErrvar (double val)` [[package](#)]

7.12.2.3 `prErrvar.prErrvar (double value, double error, int errIdx)` [[package](#)]

7.12.2.4 `prErrvar.prErrvar (double value, double[] errvec)` [[package](#)]

7.12.2.5 `prErrvar.prErrvar (String text, int errIdx)` [[package](#)]

7.12.3 Member Function Documentation

7.12.3.1 `prErrvar prErrvar.acos ()` [[package](#)]

7.12.3.2 `static prErrvar prErrvar.acos (prErrvar x)` [[static](#)], [[package](#)]

7.12.3.3 `prErrvar prErrvar.atan ()` [[package](#)]

7.12.3.4 `static prErrvar prErrvar.atan (prErrvar x)` [[static](#)], [[package](#)]

7.12.3.5 `static prErrvar prErrvar.atan2 (prErrvar y, prErrvar x)` [[static](#)], [[package](#)]

7.12.3.6 `prErrvar prErrvar.copy ()` [[package](#)]

7.12.3.7 `prErrvar prErrvar.cos ()` [[package](#)]

trigonometric function cosine

Returns

cosine of variable

7.12.3.8 `static prErrvar prErrvar.cos (prErrvar x) [static], [package]`

Trigonometric cosine

Parameters

<i>x</i>	the angular argument in units of rad.
----------	---------------------------------------

Returns

cosine of the argument

7.12.3.9 `static prErrvar [] prErrvar.cross (prErrvar[] lhs, prErrvar[] rhs) [static], [package]`

7.12.3.10 `prErrvar prErrvar.div (prErrvar rhs) [package]`

7.12.3.11 `static prErrvar prErrvar.dot (prErrvar[] lhs, prErrvar[] rhs) [static], [package]`

7.12.3.12 `static prErrvar prErrvar.hypot (prErrvar x, prErrvar y) [static], [package]`

7.12.3.13 `prErrvar prErrvar.invers () [package]`

build the reciprocal, one divided by the current value

7.12.3.14 `prErrvar prErrvar.minus () [package]`

7.12.3.15 `prErrvar prErrvar.minus (prErrvar rhs) [package]`

7.12.3.16 `prErrvar prErrvar.mult (double f) [package]`

7.12.3.17 `prErrvar prErrvar.mult (prErrvar rhs) [package]`

7.12.3.18 `static prErrvar prErrvar.negate (prErrvar rhs) [static], [package]`

7.12.3.19 `static void prErrvar.normalize (prErrvar[] rhs) [static], [package]`

Normalize to unit length

Parameters

<i>rhs</i>	the vector of values that will be divided on a component-per-component basis such that the sum of squares is one on return.
------------	---

7.12.3.20 `prErrvar prErrvar.plus (prErrvar rhs) [package]`

7.12.3.21 `prErrvar prErrvar.plus (double rhs) [package]`

add an error free constant to the term

Parameters

<i>rhs</i>	the value to be added
------------	-----------------------

Since

2007-06-29

7.12.3.22 `prErrvar prErrvar.sin () [package]`

trigonometric sine

Returns

sine of variable

7.12.3.23 `static prErrvar prErrvar.sin (prErrvar x) [static],[package]`

trigonometric sine

Parameters

<i>x</i>	the angular argument in units of rad.
----------	---------------------------------------

Returns

sine of the argument

7.12.3.24 `prErrvar prErrvar.sqrt () [package]`

7.12.3.25 `prErrvar prErrvar.square () [package]`

square (raise to power of two)

7.12.3.26 `prErrvar prErrvar.tan () [package]`

Trigonometric function tangens

Returns

tangens of variable

7.12.3.27 `static prErrvar prErrvar.tan (prErrvar x) [static],[package]`

Trigonometric function tangens

Parameters

<i>x</i>	the argument in units of radian
----------	---------------------------------

Returns

tangens of variable

7.12.3.28 `String prErrvar.toText () [package]`

Print as a string with plus/minus to indicate the error.

7.12.3.29 `String prErrvar.toText (boolean debug) [package]`

Print as a string with plus/minus to indicate the error. Also add the dependencies on the errors of the independent variables.

Parameters

<i>debug</i>	not used
--------------	----------

7.12.3.30 `String prErrvar.toTextas (double factor) [package]`

Print the as a string and convert to arcseconds or a multiple of arcseconds.

Parameters

<i>factor</i>	a divisor for the number to scale. Use 1.e-3 to print the value in units of milli-arcseconds, 1.e-6 to print it in units of micro-arcseconds, for example.
---------------	--

7.12.3.31 `String prErrvar.toTextDeg ()` [package]

Print as a string and convert from radians to degrees on the fly.

7.12.3.32 `String prErrvar.toTextSec ()` [package]

Print as a string and convert from radians to seconds on the fly with [Angle::sec\(\)](#).

7.12.4 Member Data Documentation

7.12.4.1 `double prErrvar.err` [package]

7.12.4.2 `DecimalFormat prErrvar.fd = new DecimalFormat("0.#E0")` [static], [package]

7.12.4.3 `double [] prErrvar.grads` [package]

7.12.4.4 `final int prErrvar.LST =10` [static], [package]

7.12.4.5 `final int prErrvar.N =11` [static], [package]

7.12.4.6 `final int prErrvar.PSDEC =7` [static], [package]

7.12.4.7 `final int prErrvar.PSRA =6` [static], [package]

7.12.4.8 `final int prErrvar.SSDEC =9` [static], [package]

7.12.4.9 `final int prErrvar.SSRA =8` [static], [package]

7.12.4.10 `final int prErrvar.T1AL =2` [static], [package]

7.12.4.11 `final int prErrvar.T1LAT =1` [static], [package]

7.12.4.12 `final int prErrvar.T1LO =0` [static], [package]

7.12.4.13 `final int prErrvar.T2AL =5` [static], [package]

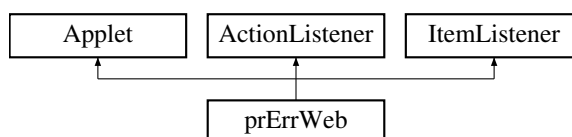
7.12.4.14 `final int prErrvar.T2LAT =4` [static], [package]

7.12.4.15 `final int prErrvar.T2LO =3` [static], [package]

7.12.4.16 `double prErrvar.val` [package]

7.13 prErrWeb Class Reference

Inheritance diagram for prErrWeb:



Public Member Functions

- void `init` ()
- void `rehash` ()
- void `toPrint` ()
- void `actionPerformed` (ActionEvent e)
- void `itemStateChanged` (ItemEvent e)

Package Attributes

- `prStationEditGUI` lolat
- `prGeoidGUI` geo
- `prStationGUI` teles
- `prStarGUI` stars
- `prLstGUI` lst
- Button `go`
- Button `pr`
- `prBaselineGUI` basel
- `prStarSepGUI` starsep
- `prSkyGUI` rays
- `prOpdGUI` opds
- `midiGUI` mid
- Label `tag`
- Color `fg`
- Color `bg`

Static Package Attributes

- static final String `GO` = " Update below!"

Static Private Attributes

- static final long `serialVersionUID` = 20080424

7.13.1 Detailed Description

Author

Richard J. Mathar

7.13.2 Member Function Documentation

7.13.2.1 void `prErrWeb.actionPerformed` (ActionEvent e)

7.13.2.2 void `prErrWeb.init` ()

7.13.2.3 void `prErrWeb.itemStateChanged` (ItemEvent e)

7.13.2.4 void `prErrWeb.rehash` ()

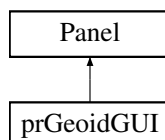
7.13.2.5 void `prErrWeb.toPrint` ()

7.13.3 Member Data Documentation

- 7.13.3.1 `prBaselineGUI prErrWeb.basel` [package]
- 7.13.3.2 `Color prErrWeb.bg` [package]
- 7.13.3.3 `Color prErrWeb.fg` [package]
- 7.13.3.4 `prGeoidGUI prErrWeb.geo` [package]
- 7.13.3.5 `Button prErrWeb.go` [package]
- 7.13.3.6 `final String prErrWeb.GO = " Update below!"` [static],[package]
- 7.13.3.7 `prStationEditGUI prErrWeb.lolat` [package]
- 7.13.3.8 `prLstGUI prErrWeb.lst` [package]
- 7.13.3.9 `midiGUI prErrWeb.mid` [package]
- 7.13.3.10 `prOpdGUI prErrWeb.opds` [package]
- 7.13.3.11 `Button prErrWeb.pr` [package]
- 7.13.3.12 `prSkyGUI prErrWeb.rays` [package]
- 7.13.3.13 `final long prErrWeb.serialVersionUID = 20080424` [static],[private]
- 7.13.3.14 `prStarGUI prErrWeb.stars` [package]
- 7.13.3.15 `prStarSepGUI prErrWeb.starsep` [package]
- 7.13.3.16 `Label prErrWeb.tag` [package]
- 7.13.3.17 `prStationGUI prErrWeb.teles` [package]

7.14 prGeoidGUI Class Reference

Inheritance diagram for prGeoidGUI:



Public Member Functions

- `prGeoidGUI` (Color fg, Color bg)

Package Functions

- void `refresh` ()

Package Attributes

- Choice `name_C`
- Label `name_L`
- `Geoid earth`

- TextField [flat_T](#)
- Label [flat_L](#)
- TextField [rhoe_T](#)
- Label [rhoe_L](#)

Static Private Attributes

- static final long [serialVersionUID](#) = 20080424

7.14.1 Detailed Description

A panel that allows to select one of the three known geodesy sets of parameters (one of the WGS83 or two of past IAU resolutions), or other ellipsoidal parameters.

Since

2007-06-29

Author

Richard J. Mathar

7.14.2 Constructor & Destructor Documentation

7.14.2.1 `prGeoidGUI.prGeoidGUI (Color fg, Color bg)`

7.14.3 Member Function Documentation

7.14.3.1 `void prGeoidGUI.rehash () [package]`

Figure out the status of the selection button (WGS84 or IAU2003 or IAU1996 or other) and set the fixed parameters for the first three of them, or activate editing and reading of the inverse flattening and equatorial radius of the last choice has been selected.

7.14.4 Member Data Documentation

7.14.4.1 `Geoid prGeoidGUI.earth [package]`

7.14.4.2 `Label prGeoidGUI.flat_L [package]`

7.14.4.3 `TextField prGeoidGUI.flat_T [package]`

7.14.4.4 `Choice prGeoidGUI.name_C [package]`

7.14.4.5 `Label prGeoidGUI.name_L [package]`

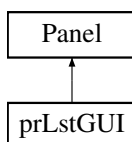
7.14.4.6 `Label prGeoidGUI.rhoe_L [package]`

7.14.4.7 `TextField prGeoidGUI.rhoe_T [package]`

7.14.4.8 `final long prGeoidGUI.serialVersionUID = 20080424 [static], [private]`

7.15 prLstGUI Class Reference

Inheritance diagram for prLstGUI:



Public Member Functions

- [prLstGUI](#) (double *l*, double *lerr*, Color *fg*, Color *bg*)
- [prLstGUI](#) (final [prStation](#) *stat*, double *lerr*, Color *fg*, Color *bg*)

Package Functions

- void [rehash](#) ()

Package Attributes

- TextField [lst_T](#)
- Label [lst_L](#)
- [prErrvar](#) *lst*

Private Member Functions

- void [init](#) (Color *fg*, Color *bg*)

Static Private Attributes

- static final long [serialVersionUID](#) = 20080424

7.15.1 Detailed Description

Author

Richard J. Mathar

7.15.2 Constructor & Destructor Documentation

7.15.2.1 [prLstGUI.prLstGUI](#) (double *l*, double *lerr*, Color *fg*, Color *bg*)

Ctor.

Parameters

<i>in</i>	<i>l</i>	a value of the <i>lst</i> in radians.
<i>in</i>	<i>lerr</i>	a value of the error in radians
<i>in</i>	<i>fg</i>	a foreground color for the GUI
<i>in</i>	<i>bg</i>	a background color for the GUI

7.15.2.2 [prLstGUI.prLstGUI](#) (final [prStation](#) *stat*, double *lerr*, Color *fg*, Color *bg*)

Ctor. The value of the *lst* is derived from the current UNIX clock at the time "now" (that is, at program execution) with respect to the given station.

Parameters

in	<i>stat</i>	the station. This represents a geographic longitude.
in	<i>lerr</i>	a value of the error in radians
in	<i>fg</i>	a foreground color for the GUI
in	<i>bg</i>	a background color for the GUI

7.15.3 Member Function Documentation

7.15.3.1 void prLstGUI.init (Color *fg*, Color *bg*) [private]

7.15.3.2 void prLstGUI.rehash () [package]

7.15.4 Member Data Documentation

7.15.4.1 prErrvar prLstGUI.lst [package]

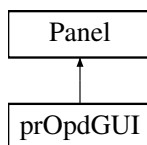
7.15.4.2 Label prLstGUI.lst_L [package]

7.15.4.3 TextField prLstGUI.lst_T [package]

7.15.4.4 final long prLstGUI.serialVersionUID = 20080424 [static],[private]

7.16 prOpdGUI Class Reference

Inheritance diagram for prOpdGUI:



Public Member Functions

- prOpdGUI (prSky[][] rays, Color foreGround, Color backGround)
- prOpdGUI (prSky pst1, prSky pst2, prSky sst1, prSky sst2, Color foreGround, Color backGround)
- void [refre](#) (prSky pst1, prSky pst2, prSky sst1, prSky sst2)

Package Attributes

- TextField[] [opd_T](#)
- Label[] [name_L](#)
- Color [fg](#)
- Color [bg](#)

Private Member Functions

- void [init](#) (prSky[][] rays)

Static Private Attributes

- static final long [serialVersionUID](#) = 20080424

7.16.1 Detailed Description

Author

Richard J. Mathar

7.16.2 Constructor & Destructor Documentation

7.16.2.1 prOpdGUI.prOpdGUI (prSkyrays *[[[]]*, Color *foreGround*, Color *backGround*)

7.16.2.2 prOpdGUI.prOpdGUI (prSky *pst1*, prSky *pst2*, prSky *sst1*, prSky *sst2*, Color *foreGround*, Color *backGround*)

7.16.3 Member Function Documentation

7.16.3.1 void prOpdGUI.init (prSkyrays *[[[]]*) [private]

7.16.3.2 void prOpdGUI.refre (prSky *pst1*, prSky *pst2*, prSky *sst1*, prSky *sst2*)

7.16.4 Member Data Documentation

7.16.4.1 Color prOpdGUI.bg [package]

7.16.4.2 Color prOpdGUI.fg [package]

7.16.4.3 Label [] prOpdGUI.name_L [package]

7.16.4.4 TextField [] prOpdGUI.opd_T [package]

7.16.4.5 final long prOpdGUI.serialVersionUID = 20080424 [static], [private]

7.17 prSky Class Reference

Public Member Functions

- double [fieldAng](#) ()

Package Functions

- [prSky](#) (prStar *what*, prStation *where*, prErrvar *houra*)
- [prErrvar](#)[] sVector ()
- [prErrvar](#)[] sVectorDt ()
- [prErrvar](#) opd (prStation *oth*)
- double [Theta](#) (final prStation *oth*)
- double [dDdTheta](#) (final prStation *oth*)
- [prErrvar](#) opdDt (prStation *oth*)
- boolean [haveDL](#) (prStation *oth*)
- [prErrvar](#) separDt (prSky *oth*)
- [prErrvar](#) pbla (prStation *oth*)

Package Attributes

- [prStar](#) *star*
- [prStation](#) *stat*
- [prErrvar](#) *A*
- [prErrvar](#) *z*
- [prErrvar](#) *h*
- [prErrvar](#) *p*

Static Package Attributes

- static final double `dHdt` = $2.0 * \text{Math.PI} / (24.0 * 3600.0)$

Private Member Functions

- `prErrvar sVector` (`prErrvar Phi`, `prErrvar delta`, `prErrvar H`, int coord)
- `prErrvar sVectorDt` (`prErrvar Phi`, `prErrvar delta`, `prErrvar H`, int coord)
- void `init` ()
- `prErrvar zenith` (`prErrvar lat`, `prErrvar delta`, `prErrvar ha`)
- `prErrvar azimuth` (`prErrvar lat`, `prErrvar delta`, `prErrvar ha`)
- `prErrvar parallact` (`prErrvar lat`, `prErrvar delta`, `prErrvar ha`)

7.17.1 Detailed Description

This class is a composite of a place on the sky, represented by a `prStar` instance, plus a place on the earth, represented by a `prStation` instance.

Author

Richard J. Mathar

7.17.2 Constructor & Destructor Documentation

7.17.2.1 `prSky.prSky` (`prStar what`, `prStation where`, `prErrvar houra`) [package]

7.17.3 Member Function Documentation

7.17.3.1 `prErrvar prSky.azimut` (`prErrvar lat`, `prErrvar delta`, `prErrvar ha`) [private]

7.17.3.2 `double prSky.dDdTheta` (final `prStation oth`) [package]

7.17.3.3 `double prSky.fieldAng` ()

7.17.3.4 `boolean prSky.haveDL` (`prStation oth`) [package]

true if this may find a MDL position with a carriage inside the tunnel limits.

Todo disabled until the (u,v,w) coordinates of the `prStation` are re-implemented

7.17.3.5 `void prSky.init` () [private]

7.17.3.6 `prErrvar prSky.opd` (`prStation oth`) [package]

```
System.out.println("dot "+ s[0].toText() + " " + s[1].toText() + " " + s[2].toText() + "\n" + b[0].toText() + " " + b[1].toText() + " " + b[2].toText() );
```

7.17.3.7 `prErrvar prSky.opdDt` (`prStation oth`) [package]

```
System.out.println("dot "+ s[0].toText() + " " + s[1].toText() + " " + s[2].toText() + "\n" + b[0].toText() + " " + b[1].toText() + " " + b[2].toText() );
```

7.17.3.8 `prErrvar prSky.parallact` (`prErrvar lat`, `prErrvar delta`, `prErrvar ha`) [private]

7.17.3.9 `prErrvar prSky.pbla` (`prStation oth`) [package]

7.17.3.10 `prErrvar prSky.separDt` (`prSky oth`) [package]

7.17.3.11 `prErrvar [] prSky.sVector ()` [package]

7.17.3.12 `prErrvar prSky.sVector (prErrvar Phi, prErrvar delta, prErrvar H, int coord)` [private]

Calculate the three Cartesian components of the direction to the star in the local geodetic system. This implements eqs. (66)-(68) in [?].

Parameters

in	<i>Phi</i>	geodetic latitude of place of observer in radians
in	<i>delta</i>	star declination in radians
in	<i>H</i>	hour angle in radians
in	<i>coord</i>	the component of the value returned, 0 for the first (North), 1 for the second (West) and 2 for the third (up).

Returns

the abscissa section of the vector to the star

7.17.3.13 `prErrvar [] prSky.sVectorDt ()` [package]

7.17.3.14 `prErrvar prSky.sVectorDt (prErrvar Phi, prErrvar delta, prErrvar H, int coord)` [private]

7.17.3.15 `double prSky.Theta (final prStation oth)` [package]

7.17.3.16 `prErrvar prSky.zenith (prErrvar lat, prErrvar delta, prErrvar ha)` [private]

7.17.4 Member Data Documentation

7.17.4.1 `prErrvar prSky.A` [package]

7.17.4.2 `final double prSky.dHdt = 2.0*Math.PI/(24.0*3600.0)` [static], [package]

7.17.4.3 `prErrvar prSky.h` [package]

7.17.4.4 `prErrvar prSky.p` [package]

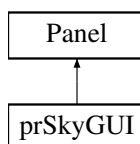
7.17.4.5 `prStar prSky.star` [package]

7.17.4.6 `prStation prSky.stat` [package]

7.17.4.7 `prErrvar prSky.z` [package]

7.18 prSkyGUI Class Reference

Inheritance diagram for prSkyGUI:



Public Member Functions

- `prSkyGUI (prSky pst1, prSky pst2, prSky sst1, prSky sst2, Color foreground, Color background)`
- `void refre (prSky pst1, prSky pst2, prSky sst1, prSky sst2)`

Package Attributes

- TextField[] [A_T](#)
- TextField[] [z_T](#)
- TextField[] [p_T](#)
- Label[] [ray_L](#)
- Label[] [p_L](#)
- Label[][] [Az_L](#)
- Color [fg](#)
- Color [bg](#)

Private Member Functions

- void [init](#) ([prSky](#)[][] rays)

Static Private Attributes

- static final long [serialVersionUID](#) = 20080424

7.18.1 Detailed Description

Author

Richard J. Mathar

7.18.2 Constructor & Destructor Documentation

7.18.2.1 [prSkyGUI.prSkyGUI](#) ([prSky](#) *pst1*, [prSky](#) *pst2*, [prSky](#) *sst1*, [prSky](#) *sst2*, [Color](#) *foreGround*, [Color](#) *backGround*)

7.18.3 Member Function Documentation

7.18.3.1 void [prSkyGUI.init](#) ([prSkyrays](#) [][]) [private]

7.18.3.2 void [prSkyGUI.refre](#) ([prSky](#) *pst1*, [prSky](#) *pst2*, [prSky](#) *sst1*, [prSky](#) *sst2*)

7.18.4 Member Data Documentation

7.18.4.1 TextField [] [prSkyGUI.A_T](#) [package]

7.18.4.2 Label [][] [prSkyGUI.Az_L](#) [package]

7.18.4.3 Color [prSkyGUI.bg](#) [package]

7.18.4.4 Color [prSkyGUI.fg](#) [package]

7.18.4.5 Label [] [prSkyGUI.p_L](#) [package]

7.18.4.6 TextField [] [prSkyGUI.p_T](#) [package]

7.18.4.7 Label [] [prSkyGUI.ray_L](#) [package]

7.18.4.8 final long [prSkyGUI.serialVersionUID](#) = 20080424 [static],[private]

7.18.4.9 TextField [] [prSkyGUI.z_T](#) [package]

7.19 prStar Class Reference

Package Functions

- `prStar` (double *RA*, double *errRa*, double *DEC*, double *errDec*, int *indx*)
- `prStar` (String *RA*, double *errRa*, String *DEC*, double *errDec*, int *indx*)
- `prStar` (`prErrvar alpha`, `prErrvar delta`)
- `prErrvar[] coords` ()
- `prErrvar separ` (`prStar oth`)
- `prErrvar orient` (`prStar oth`)
- double `alpha` (String *RA*)
- double `delta` (String *DEC*)

Package Attributes

- `prErrvar ra`
- `prErrvar dec`

7.19.1 Detailed Description

A star is a direction expressed in elliptical coordinates.

Author

Richard J. Mathar

7.19.2 Constructor & Destructor Documentation

7.19.2.1 `prStar.prStar` (double *RA*, double *errRa*, double *DEC*, double *errDec*, int *indx*) [package]

Ctor.

Parameters

<i>RA</i>	right ascension in radians.
<i>errRa</i>	error in RA
<i>DEC</i>	declination in radians
<i>errDec</i>	error in DEC
<i>indx</i>	0 for the primary star, 1 for the secondary.

7.19.2.2 `prStar.prStar` (String *RA*, double *errRa*, String *DEC*, double *errDec*, int *indx*) [package]

7.19.2.3 `prStar.prStar` (`prErrvar alpha`, `prErrvar delta`) [package]

Ctor with fully worked out coordinates.

Parameters

<i>in</i>	<i>alpha</i>	right ascension in radians
<i>in</i>	<i>delta</i>	declination in radians.

7.19.3 Member Function Documentation

7.19.3.1 double `prStar.alpha` (String *RA*) [package]

7.19.3.2 `prErrvar [] prStar.coords` () [package]

7.19.3.3 `double prStar.delta (String DEC)` [package]

7.19.3.4 `prErrvar prStar.orient (prStar oth)` [package]

7.19.3.5 `prErrvar prStar.separ (prStar oth)` [package]

7.19.4 Member Data Documentation

7.19.4.1 `prErrvar prStar.dec` [package]

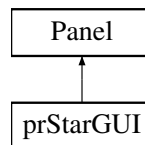
Declination in radians.

7.19.4.2 `prErrvar prStar.ra` [package]

Right ascension in radians.

7.20 prStarGUI Class Reference

Inheritance diagram for prStarGUI:



Public Member Functions

- [prStarGUI](#) (Color fg, Color bg)

Package Functions

- void [rehash](#) ()

Package Attributes

- [prStar\[\] star](#)
- [TextField\[\]\[\] RD_T](#)
- [Label\[\]\[\] RD_L](#)
- [TextField\[\]\[\] RDerr_T](#)
- [Label\[\]\[\] RDerr_L](#)
- [Label\[\] name_L](#)

Static Private Attributes

- static final long [serialVersionUID](#) = 20080424

7.20.1 Detailed Description

Author

Richard J. Mathar

7.20.2 Constructor & Destructor Documentation

7.20.2.1 prStarGUI.prStarGUI (Color fg, Color bg)

7.20.3 Member Function Documentation

7.20.3.1 void prStarGUI.rehash () [package]

7.20.4 Member Data Documentation

7.20.4.1 Label [] prStarGUI.name_L [package]

7.20.4.2 Label [][] prStarGUI.RD_L [package]

7.20.4.3 TextField [][] prStarGUI.RD_T [package]

7.20.4.4 Label [][] prStarGUI.RDerr_L [package]

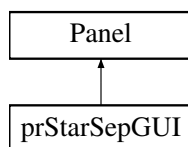
7.20.4.5 TextField [][] prStarGUI.RDerr_T [package]

7.20.4.6 final long prStarGUI.serialVersionUID = 20080424 [static], [private]

7.20.4.7 prStar [] prStarGUI.star [package]

7.21 prStarSepGUI Class Reference

Inheritance diagram for prStarSepGUI:



Public Member Functions

- [prStarSepGUI](#) (double t, Color foreGround, Color backGround)
- [prStarSepGUI](#) (prSky ps, prSky ss, Color foreGround, Color backGround)

Package Functions

- void [rehash](#) (prSky ps, prSky ss)

Package Attributes

- TextField [tau_T](#)
- Label [tau_L](#)
- prErrvar [tau](#)
- TextField [ori_T](#)
- Label [ori_L](#)
- prErrvar [ori](#)
- Color [fg](#)
- Color [bg](#)

Private Member Functions

- void [refres](#) ()
- void [init](#) ()

Static Private Attributes

- static final long [serialVersionUID](#) = 20080424

7.21.1 Constructor & Destructor Documentation

7.21.1.1 [prStarSepGUI.prStarSepGUI](#)(double *t*, Color *foreGround*, Color *backGround*)

7.21.1.2 [prStarSepGUI.prStarSepGUI](#)([prSky ps](#), [prSky ss](#), Color *foreGround*, Color *backGround*)

7.21.2 Member Function Documentation

7.21.2.1 void [prStarSepGUI.init](#)() [private]

7.21.2.2 void [prStarSepGUI.refres](#)() [private]

7.21.2.3 void [prStarSepGUI.rehash](#)([prSky ps](#), [prSky ss](#)) [package]

7.21.3 Member Data Documentation

7.21.3.1 Color [prStarSepGUI.bg](#) [package]

7.21.3.2 Color [prStarSepGUI.fg](#) [package]

7.21.3.3 [prErrvar prStarSepGUI.ori](#) [package]

7.21.3.4 Label [prStarSepGUI.ori.L](#) [package]

7.21.3.5 TextField [prStarSepGUI.ori.T](#) [package]

7.21.3.6 final long [prStarSepGUI.serialVersionUID = 20080424](#) [static],[private]

7.21.3.7 [prErrvar prStarSepGUI.tau](#) [package]

7.21.3.8 Label [prStarSepGUI.tau.L](#) [package]

7.21.3.9 TextField [prStarSepGUI.tau.T](#) [package]

7.22 prStation Class Reference

Package Functions

- [prStation](#) (String *stdName*, final [Geoid](#) *earth*, double *lon*, double *lat*, double *altit*)
- [prStation](#) (String *stdName*, int *indx*, final [Geoid](#) *earth*, [prErrvar lon](#), [prErrvar lat](#), [prErrvar altit](#), [prErrvar lonRef](#), [prErrvar latRef](#), [prErrvar altitRef](#))
- [prStation](#) (String *stdName*, final [Geoid](#) *earth*)
- [prStation](#) (String *stdName*)
- int [name2indx](#) ()
- boolean [isUT](#) ()
- boolean [isNorth](#) ()
- double [opl](#) ()
- [prDL assocMdl](#) ()
- [prErrvar basel](#) ([prStation](#) *oth*)

- double `Theta` (final `prStation` oth, double D)
- double `lst` ()
- `prErrvar[]` `baseVec` (`prStation` oth)
- `prErrvar` `pbla` (`prStation` oth, `prSky` ps)
- void `initCoord` (double lon, double lat, double altit, final `Geoid` earth)
- void `initCoord` (`prErrvar` lon, `prErrvar` lat, `prErrvar` altit, `prErrvar` lonRef, `prErrvar` latRef, `prErrvar` altitRef, final `Geoid` earth)

Static Package Functions

- static int `name2indx` (String stdName)

Package Attributes

- String `name`
- `prErrvar` `lambda`
- `prErrvar` `Phi`
- `prErrvar` `alt`
- `prErrvar[]` `geoCen`
- `prErrvar[]` `locGeod`

Static Package Attributes

- static final String[] `ids`

Private Member Functions

- `prErrvar` `baseVec` (`prErrvar` Phi1, `prErrvar` lambda1, `prErrvar` Phi2, `prErrvar` lambda2, int coord)

Static Private Member Functions

- static double[] `mul3D` (final double[][] mat, final double[] in)
- static `prErrvar[]` `mul3D` (final `prErrvar`[][] mat, final `prErrvar`[] in)

Static Private Attributes

- static double[][] `gps`
- static double `uvw0alt` = 2681.0
- static double `uvw0height` = 6378.e3+`uvw0alt`

7.22.1 Detailed Description

A station is a point on or above the geoid. It is addressed by geographic longitude, latitude, and altitude above the geoid.

Author

Richard J. Mathar

7.22.2 Constructor & Destructor Documentation

7.22.2.1 prStation.prStation (String *stdName*, final Geoid *earth*, double *lon*, double *lat*, double *altit*) [package]

Ctor.

Parameters

<i>stdName</i>	a 2-letter string like "G0" or "U1" for the location.
<i>earth</i>	description of the geodic parameters
<i>lon</i>	geodetic longitude in radian
<i>lat</i>	geodetic latitude in radian
<i>altit</i>	height above geoid in meters

Since

2007-06-28

7.22.2.2 prStation.prStation (String *stdName*, int *indx*, final Geoid *earth*, prErrvar *lon*, prErrvar *lat*, prErrvar *altit*, prErrvar *lonRef*, prErrvar *latRef*, prErrvar *altitRef*) [package]

Ctor.

Parameters

<i>stdName</i>	a 2-letter string like "G0" or "U1" for the location.
<i>indx</i>	a 0 for the first telescope, T1, of the interferometer, or a 1 for the second, T2.
<i>earth</i>	description of the geodic parameters
<i>lon</i>	geodetic longitude in radian
<i>lat</i>	geodetic latitude in radian
<i>altit</i>	height above geoid in meters
<i>lonRef</i>	geodetic longitude of the reference point (VLTI the U=V=W origin) in radian
<i>latRef</i>	geodetic latitude of the reference point in radian
<i>altitRef</i>	height of the reference point above geoid in meters

Since

2007-06-29

7.22.2.3 prStation.prStation (String *stdName*, final Geoid *earth*) [package]

Ctor.

Parameters

<i>stdName</i>	a 2-letter string like "G0" or "U1" for the location. a 1 for the second, T2.
<i>earth</i>	description of the geodic parameters

Since

2007-06-29

7.22.2.4 prStation.prStation (String *stdName*) [package]

Ctor.

Parameters

<i>stdName</i>	a 2-letter string like "G0" or "U1" for the location. a 1 for the second, T2.
----------------	---

7.22.3 Member Function Documentation

7.22.3.1 prDL prStation.assocMdl () [package]

Create a MDL (main delay line) associated with this station.

Returns

a [prDL](#) instance.

Todo re-implement dependence on the u value of [prStation](#)

7.22.3.2 prErrvar prStation.basel (prStation oth) [package]

Compute baseline length to another station. This is the Pythagorean distance between the two station's cartesian coordinates and those of the other station.

Parameters

<i>oth</i>	the other prStation .
------------	---------------------------------------

Returns

baseline length in meters.

7.22.3.3 prErrvar [] prStation.baselVec (prStation oth) [package]

7.22.3.4 prErrvar prStation.baselVec (prErrvar Phi1, prErrvar lambda1, prErrvar Phi2, prErrvar lambda2, int coord) [private]

7.22.3.5 void prStation.initCoord (double lon, double lat, double altit, final Geoid earth) [package]

Parameters

<i>lon</i>	geodetic longitude in radian
<i>lat</i>	geodetic latitude in radian
<i>altit</i>	height above geoid in meters
<i>earth</i>	Earth geodesy parameters

Since

2007-06-28

7.22.3.6 void prStation.initCoord (prErrvar lon, prErrvar lat, prErrvar altit, prErrvar lonRef, prErrvar latRef, prErrvar altitRef, final Geoid earth) [package]

Parameters

<i>lon</i>	geodetic longitude in radian
<i>lat</i>	geodetic latitude in radian
<i>altit</i>	height above geoid in meters
<i>lonRef</i>	geodetic longitude of the array reference in radian
<i>latRef</i>	geodetic latitude of the array reference in radian
<i>altitRef</i>	height of the array reference above geoid in meters
<i>earth</i>	Earth geodesy parameters

Since

2007-06-28

7.22.3.7 boolean prStation.isNorth () [package]

Deciphers whether is is north or south of the delay line tunnel.

Returns

true if the station is north of the DL tunnel. This is for example the value for all UT's, and for a few AT's.

All stations on the A to E rails, H to I rails, or K to M rails are south.

All UT's are north.

On the G rail, G0 and G1 are south, G2 is north.

On the J rail, J1 and J2 are south, all the others north.

7.22.3.8 boolean prStation.isUT () [package]

Deciphers whether this is a UT or an AT.

Returns

true if a UT, false if an AT.

7.22.3.9 double prStation.lst () [package]

The local sidereal time on the Paranal UVW coordinate now. Now means at the execution of the program the clock is read from the computer the program is running on.

Returns

The sidereal time in radian, normalized to the interval $[0, 2\pi]$.

7.22.3.10 static double [] prStation.mul3D (final doublemat[][], final double[] in) [static], [private]

Matrix multiplication of matrix and vector.

Parameters

<i>in1</i>	the vector of 3 coordinates of the left multiplier
<i>in2</i>	the vector of 3 coordinates of the right multiplier
<i>out</i>	the vector of 3 coordinates of product in1 (x) in2

Returns

the length of the vector returned in out .

7.22.3.11 static prErrvar [] prStation.mul3D (final prErrvarmat[][], final prErrvar[] in) [static], [private]

Matrix multiplication of matrix and vector.

Parameters

<i>in1</i>	the vector of 3 coordinates of the left multiplier
<i>in2</i>	the vector of 3 coordinates of the right multiplier
<i>out</i>	the vector of 3 coordinates of product in1 (x) in2

Returns

the length of the vector returned in out .

7.22.3.12 `int prStation.name2indx ()` [package]

Assign an integer number to a name

Returns

an index starting at 0 with "U1", using 4 for "A1" etc. Returns -1 for invalid names.

Since

2007-06-29

Author

Richard J. Mathar

7.22.3.13 `static int prStation.name2indx (String stdName)` [static],[package]

Assign an integer number to a name

Parameters

<i>stdName</i>	a string of the standard 2-letter format "U1", "B2" etc
----------------	---

Returns

an index starting at 0 with "U1", using 4 for "A1" etc. Returns -1 for invalid names.

Since

2007-06-29

Author

Richard J. Mathar

7.22.3.14 `double prStation.opl ()` [package]

Optical path length from the station through the Coude train and VLTI train to the PRIMA FSU.

Returns

the path length in meters.

Todo disfunctional until the components of (u,v) of the class are re-implemented

7.22.3.15 `prErrvar prStation.pbla (prStation oth, prSky ps)` [package]

Compute projected baseline orientation angle.

See Also

[?]

MIDI optical path differences and phases.

Returns

projected baseline orientation angle in radians. The direction to the North Celestial pole has zero degrees; the angle becomes positive if turning to the East.

7.22.3.16 `double prStation.Theta (final prStation oth, double D)` [package]

Calculate the angle between the baseline and the star. This is the angle θ in Fig. 2 of [?].

Parameters

<code>oth</code>	the other telescope's station
<code>D</code>	the external path delay in meters.

Returns

the angle between the direction to the other telescope and the direction to the star in radians. This is in the range 0 to 2π .

7.22.4 Member Data Documentation

7.22.4.1 `prErrvar prStation.alt` [package]

Height above geoid in meters.

7.22.4.2 `prErrvar [] prStation.geoCen` [package]

Three geocentric (OIFITS) Cartesian coordinates in meters. The second coordinate is positive for observatories east of Greenwich. The third coordinate is positive for observatories in the northern hemisphere.

Since

2007-06-28

7.22.4.3 `double [][] prStation.gps` [static],[private]

The GPS coordinates measured in 2005 and reported in VLTSW20050024. Geographic longitudes and latitudes (in radians), one per station in the same order as in `prStation::ids`.

7.22.4.4 `final String [] prStation.ids` [static],[package]**Initial value:**

```
= { "U1", "U2", "U3", "U4", "A0", "A1", "B0", "B1", "B2", "B3", "B4", "B5", "C0", "C1",
    "C2", "C3",
    "D0", "D1", "D2", "E0", "G0", "G1", "G2", "H0", "I1", "J1", "J2", "J3",
    "J4", "J5", "J6", "K0", "L0", "M0", "ZE",
    "Ke1", "Ke2"
}
```

A list of the Paranal stations for UT's or AT's. The name "ZE" is added for the zero (reference) point, which is between U1 and U2 for the VLTI, and the `gps` array gets the `uvw0` such that this is editable for other observatories. Ke1 and Ke2 are Keck, <http://www.ifa.hawaii.edu/mko/coordinates.html>.

7.22.4.5 `prErrvar prStation.lambda` [package]

Paranal platform U coordinate in meters.

`prErrvar u` ; Paranal platform V coordinate in meters. `prErrvar v` ; Paranal platform W coordinate in meters. `prErrvar w` ; Geographic longitude in radians. Positive if East of Greenwich.

7.22.4.6 prErrvar [] prStation.locGeod [package]

Three local geodetic cartesian coordinates with respect to the observatory center in meters

Since

2007-06-28

7.22.4.7 String prStation.name [package]

The canonical VLTI name of the station, like "U4" for the static position of the UT4, or "B3" for a potential station of one of the AT's.

7.22.4.8 prErrvar prStation.Phi [package]

Geographic latitude in radians. Postive if in the northern hemisphere of the globe, zero on the equator.

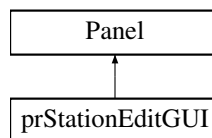
7.22.4.9 double prStation.uvw0alt = 2681.0 [static],[private]

A common standard geographic altitude of the Paranal platform in meters. Taken from ISS primary header keywords ESO ISS GEOELEV in May 2007.

7.22.4.10 double prStation.uvw0height = 6378.e3+uvw0alt [static],[private]

7.23 prStationEditGUI Class Reference

Inheritance diagram for prStationEditGUI:



Public Member Functions

- [prStationEditGUI](#) (Color fg, Color bg)

Package Functions

- void [rehash](#) ()
- void [refres](#) ()

Package Attributes

- Choice [name_C](#)
- [prErrvar](#)[][] [lonLatAlt](#)
- TextField [lon_T](#)
- Label [lon_L](#)
- TextField [lat_T](#)
- Label [lat_L](#)
- TextField [alt_T](#)
- Label [alt_L](#)

Static Private Attributes

- static final long `serialVersionUID` = 20080424

7.23.1 Detailed Description

This is an interface to a store of the three geodetic variables (longitude, latitude, altitude) for each of the telescope stations.

Author

Richard J. Mathar

Since

2007-06-29

7.23.2 Constructor & Destructor Documentation

7.23.2.1 `prStationEditGUI.prStationEditGUI (Color fg, Color bg)`

7.23.3 Member Function Documentation

7.23.3.1 `void prStationEditGUI.refres ()` [package]

7.23.3.2 `void prStationEditGUI.rehash ()` [package]

7.23.4 Member Data Documentation

7.23.4.1 `Label prStationEditGUI.alt_L` [package]

7.23.4.2 `TextField prStationEditGUI.alt_T` [package]

7.23.4.3 `Label prStationEditGUI.lat_L` [package]

7.23.4.4 `TextField prStationEditGUI.lat_T` [package]

7.23.4.5 `Label prStationEditGUI.lon_L` [package]

7.23.4.6 `TextField prStationEditGUI.lon_T` [package]

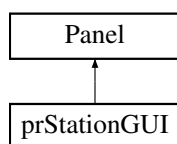
7.23.4.7 `prErrvar [][] prStationEditGUI.lonLatAlt` [package]

7.23.4.8 `Choice prStationEditGUI.name_C` [package]

7.23.4.9 `final long prStationEditGUI.serialVersionUID = 20080424` [static], [private]

7.24 prStationGUI Class Reference

Inheritance diagram for prStationGUI:



Public Member Functions

- [prStationGUI](#) (final [Geoid](#) earth, Color fg, Color bg)

Package Functions

- void [rehash](#) (final [Geoid](#) earth)
- void [rehash](#) (final [Geoid](#) earth, final [prErrvar](#)[][] lonLatAlt)
- [prErrvar](#) [basel](#) ()

Package Attributes

- Choice[] [name_C](#)
- Label[] [name_L](#)
- [prStation](#)[] [station](#)

Static Private Attributes

- static final long [serialVersionUID](#) = 20080424

7.24.1 Detailed Description

Author

Richard J. Mathar

7.24.2 Constructor & Destructor Documentation

7.24.2.1 prStationGUI.prStationGUI (final Geoid earth, Color fg, Color bg)

Ctor

Parameters

in	<i>earth</i>	the geodetic parameters to be used to assign geocentric coordinates to the two stations
in	<i>fg</i>	foreground color for the GUI
in	<i>bg</i>	background color for the GUI

7.24.3 Member Function Documentation

7.24.3.1 prErrvar prStationGUI.basel () [package]

Compute the baseline length for the current pair of telescopes.

Returns

a baseline length in meters.

7.24.3.2 void prStationGUI.rehash (final Geoid earth) [package]

7.24.3.3 void prStationGUI.rehash (final Geoid earth, final prErrvar lonLatAlt[][]) [package]

7.24.4 Member Data Documentation

7.24.4.1 `Choice [] prStationGUI.name_C` [package]

The selector with values of "U1" over "M0" up to "ZE", the latter refereing to the common reference point of the array center.

7.24.4.2 `Label [] prStationGUI.name_L` [package]

7.24.4.3 `final long prStationGUI.serialVersionUID = 20080424` [static],[private]

7.24.4.4 `prStation [] prStationGUI.station` [package]

Two instances of `prStation`, `station[0]` for T1 and `station[1]` for T2.

8 File Documentation

8.1 prErrWeb.java File Reference

Classes

- class `prErrvar`
- class `Angle`
- class `Geoid`
- class `prDL`
- class `prStation`
- class `prStar`
- class `prSky`
- class `midi`
- class `prErr`
- class `midiGUI`
- class `prStarGUI`
- class `prSkyGUI`
- class `prGeoidGUI`
- class `prStationEditGUI`
- class `prStationGUI`
- class `prLstGUI`
- class `prBaselineGUI`
- class `prStarSepGUI`
- class `prOpdGUI`
- class `prErrWeb`

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