newsimulator changes some columns to the MeasurementSet to store results of processing. The following columns in the MS are particularly important:

DATA The original observed visibilities are in a column called DATA. These are normally not altered by any processing in AIPS++. However, this simulation program does overwrite these values.

CORRECTED_DATA During a calibration process, as carried out by *e.g.* calibrater, the visibilities may be corrected for calibration effects. This corrected visibilities are stored in a column CORRECTED_DATA which is created on demand.

MODEL_DATA During various phases of processing, the visibilities as predicted from some model are required. These model visibilities are stored in a column MODEL_DATA. The ft function of the imager tool should be used to calculate the model visibility for a model image or componentmodels.

Standard tools such as the table module and the ms can be used to access and possibly change these (and all other) columns.

Tools

newsimhelper	Tool to help newsimulator
newsimulator	Tool for simulation

1.8.1 newsimulator - Tool

Package	synthesis
Module	newsimulator

Tool for simulation

Description
newsimulator is a tool that performs simulation of synthesis data, including (optionally) creation of a MeasurementSet, prediction of model data, and corruption by various physical effects.

Constructors

newsimulator	Construct a newsimulator tool
newsimulatorfromms	Construct a newsimulator tool from a MS

Functions

Done	Close the newsimulator tool
close	Close the newsimulator tool
corrupt	Corrupt the data with visibility errors
name	Provide the name of the attached MeasurementSet
observe	Observe a given configuration
predict	Predict astronomical data from an image
reset	Reset the corruption terms
setauto	Set autocorrelation weight
setbandpass	Set the bandpasses
setconfig	Set the antenna configuration
setdata	Set the data parameters selection for subsequent processing
setfeed	Set the feed parameters
setfield	Set one or more observed fields
setgain	Set the gains
setknownconfig	Set the antenna configuration to a known array
setleakage	Set the polarization leakage
setlimits	Set limits for observing
setmosaicfield	Set observed mosaic fields
setnoise	Set the noise level
setoptions	Set various processing options
setpa	Corrupt phase by the parallactic angle
setseed	Set the seed for the random number generator
setspwindow	Set one or more spectral windows
settimes	Set integration time, *etc.*
setvp	Set the voltage pattern model for subsequent processing
summary	Summarize the current state
type	Return the type of this tool

newsimulator - Constructor

Package	synthesis
Module	newsimulator
Tool	newsimulator

Construct a newsimulator tool

Synopsis
newsimulator(ms)

Description
This is used to construct newsimulator tools. A newsimulator

tool can either be instantiated from an existing MeasurementSet, predicting and/or corrupting data on the given coordinates, or it can be used to create a fundamentally new MeasurementSet from descriptions of the array configuration and the observational parameters. This is useful for making a newsimulator tool which will make a MeasurementSet from scratch. In order to do this, you must also run setconfig, setfield, setspwindow, setfeed, and settimes. Creating the actual MS is performed by observe. Data can be predict-ed and then corrupted-ed. In this example, we read in the antenna coordinates from an ASCII file:

Arguments

ms	MeasurementSet to be created Allowed: Table name Default: 'MS'

Returns
newsimulator tool

Example

```
  tabname := 'VLAC.LOCAL.TAB';  asciifile := 'VLAC.LOCAL.STN'
  mytab := tablefromascii(tabname, asciifile);
  xx:=[]; yy:=[]; zz:=[]; diam:=[];
  xx := mytab.getcol('X');
  yy := mytab.getcol('Y');
  zz := mytab.getcol('Z');
  diam := mytab.getcol('DIAM');
#
  mysim := newsimulator('NEW1.ms');
# do configuration
  posvla := dm.observatory('vla');  #  dm.observatory('ALMA') also works!
  mysim.setconfig(telescopename='VLA', x=xx, y=yy, z=zz, dishdiameter=diam,
        mount='alt-az', antname='VLA',
                coordsystem='local', referencelocation=posvla);

# Initialize the spectral windows
  mysim.setspwindow(spwname='CBand', freq='5GHz',
    deltafreq='50MHz',
    freqresolution='50MHz',
    nchannels=1,
    stokes='RR RL LR LL');
```

```
  mysim.setspwindow(spwname='LBand', freq='1.420GHz',
    deltafreq='3.2MHz',
    freqresolution='3.2MHz',
    nchannels=32,
    stokes='RR LL');


# Initialize the source and calibrater
  mysim.setfield(sourcename='My cal',
 sourcedirection=dm.direction('J2000','00h0m0.0','+45.0.0.000'),
 calcode='A');
  mysim.setfield(sourcename='My source',
 sourcedirection=dm.direction('J2000','01h0m0.0','+47.0.0.000'));

  mysim.setlimits(shadowlimit=0.001, elevationlimit='8.0deg');
  mysim.setauto(autocorrwt=0.0);

  mysim.settimes(integrationtime='10s', usehourangle=F, referencetime=dm.epoch('utc', 'today'));

  mysim.observe('My cal', 'LBand', starttime='0s', stoptime='300s');
  mysim.observe('My source', 'LBand', starttime='310s', stoptime='720s');
  mysim.observe('My cal', 'CBand', starttime='720s', stoptime='1020s');
  mysim.observe('My source', 'CBand', starttime='1030s', stoptime='1500s');

  mysim.setdata(spwid=1, fieldid=1);
  mysim.predict(modelimage='M31.MOD');
  mysim.setdata(spwid=2, fieldid=2);
  mysim.predict(modelimage='BigLBand.MOD');
  mysim.close();
```

---

newsimulatorfromms - Constructor

Package	synthesis
Module	newsimulator
Tool	newsimulator

Construct a newsimulator tool from a MS

Synopsis
newsimulatorfromms(ms)

Description

This is used to construct newsimulator tools operating on an existing MS. Data can be predicted and/or corrupted on the MS's given coordinates.

Arguments

ms	MeasurementSet to be processed	
	Allowed:	Table name
	Default:	'MS'

Returns
newsimulator tool

Example

```
mysim := newsimulatorfromms('3C273XC1.MS');
mysim.predict('3C273XC1.modelImage');
mysim.setnoise(simplenoise='10mJy');
mysim.setgain(interval='100s', amplitude=[0.01, 0.01]);
mysim.corrupt();
mysm.close();
```

---

newsimulator.close - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Close the newsimulator tool

Synopsis
close()

Description
This is used to close newsimulator tools. Note that the data is written to disk. This is a synonym for done.

Returns
Bool

---

newsimulator.Done - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Close the newsimulator tool

Synopsis
Done()

Description
This is used to close and newsimulator tools. Note that the data is written to disk. This is a synonym for close.

Returns
Bool

---

newsimulator.name - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Provide the name of the attached MeasurementSet

Synopsis
name()

Description
Returns the name of the attached MeasurementSet.

Returns
String

---

newsimulator.summary - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Summarize the current state

Synopsis
summary()

Description
Writes a summary of the properties of the newsimulator to the default logger.

Returns
Bool

---

newsimulator.type - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Return the type of this tool

Synopsis
type()

Returns
String or fail

Description
This function returns the string 'newsimulator'. It is used so that in a script, you can make sure this *Glish* variable is a newsimulator tool.

---

newsimulator.settimes - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Set integration time, *etc.*

Synopsis
settimes(integrationtime, usehourangle, referencetime) geg

Description
The start and stop times are referenced to referencetime. Use either starttime/stoptime or startha/stopha. If the hour angles are specified, then the start and stop times are calculated such that the start time is later than the reference time, but less than one day later. The hour angles refer to the first source observed.

Arguments

integrationtime	Integration time Allowed: Quantity Default: '10s'
usehourangle	Use starttime/stoptime as hour angles - else they are referenced to referencetime Allowed: Bool Default: T
referencetime	Reference time for starttime and stoptime Allowed: Epoch Default: '50000d'

---

newsimulator.observe - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Observe a given configuration

Synopsis
observe(sourcename, spwname, starttime, stoptime)

Description
Observe a given source with a given spectral window for the specified times, including start, stop, integration, and gap times. The start and stop times are referenced to referencetime. Use either starttime/stoptime or startha/stopha. If the hour angles are specified, then the start and stop times are calculated such that the start time is later than the reference time, but less than one day later. The hour angles refer to the first source observed.

Arguments

sourcename	Name of source or field (must be specified) Allowed String Default None
spwname	Unique user-supplied name for this spectral window Allowed String Default None
starttime	Start time referenced to referenceepoch Allowed Quantity Default '0s'
stoptime	Stop time referenced to referenceepoch Allowed Quantity Default '3600s'

---

newsimulator.setlimits - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Set limits for observing

Synopsis
setlimits(shadowlimit, elevationlimit)

Description

Data are flagged for two conditions:

Below elevation limit If either of the antennas point below the specified elevation limit then the data are flagged. The elevation is calculated correctly for antennas at different locations (such as occurs in VLBI).

Shadowing If one antenna shadows another such that the fractional (geometric) blockage is greater than the specified limit then the data are flagged. No correction for blockage is made for shadowed but non-flagged points.

Arguments

shadowlimit	Maximum fraction of geometrically shadowed area before flagging occurs Allowed: Double Default: 1e-6
elevationlimit	Minimum elevation angle before flagging occurs Allowed: Quantity Default: '10deg'

---

newsimulator.setauto - Function

Package synthesis
Module newsimulator
Tool newsimulator

Set autocorrelation weight

Synopsis
setauto(autocorrwt)

Description

Arguments

autocorrwt	Weight to assign autocorrelations (0=none) Allowed: Float Default: 0.0

---

newsimulator.setconfig - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Set the antenna configuration

Synopsis

```
setconfig(telescopename, x, y, z, dishdiameter, mount, antname,
coordsystem, referencelocation)
```

Description

Set the positions of the antennas. Note that the name of the telescope will control which voltage pattern is applied to the data.

Arguments

telescopename	Name of the telescope we are simulating (determines VP) Allowed String Default 'VLA'
x	Vector of x values of all antennas [currently m] Allowed Vector Default []
y	Vector of y values of all antennas [currently m] Allowed Vector Default []
z	Vector of z values of all antennas [currently m] Allowed Vector Default []
dishdiameter	Vector of diameters of all antennas [currently m] Allowed Vector Default []
mount	Vector of mount types of all antennas (recognized mounts are 'ALT-AZ', 'EQUATORIAL', 'X-Y', 'ORBITING', 'BIZARRE' Allowed Vector of strings Default []
antname	Vector of names of all antennas Allowed Vector of strings Default []
coordsystem	Coordinate system of antenna positions [x,y,z] Allowed String: 'global' | 'local' | 'longlat' Default 'global'
referencelocation	Reference location [required for local coords] Allowed MPosition

Example

```
diam := [25, 25, 25, 25, 25]
xx := [50, 100, 150, 200, 250]
yy := [2, -5, -20, -50, -100]
zz := [-0.5, -1.0, -1.5, -2.0, -2.5]
posvla := dm.observatory('vla');
mysim.setconfig(telescopename='VLA', x=xx, y=yy, z=zz, dishdiameter=diam,
               mount='alt-az', antname='VLA',
```

```
                coordsystem='local', referencelocation=posvla);
```

In this example we configure an array of 5 dishes set at the VLA position. We use the measures tool to give us the location of the vla.

---

newsimulator.setknownconfig - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Set the antenna configuration to a known array

Synopsis
setknownconfig(arrayname)

Description
Sets the configuration to a known array such as VLAA, VLBA, EVN or ATCA6.0A. The arrays are those known to newsimhelper. All the information needed by setconfig is filled in.

Arguments

arrayname	Name of the telescope configurationwe are simulating Allowed String Default: 'VLAA'

Example

```
 mysim.setknownconfig('ATCA6.0A');
```

In this example we configure an array of 5 dishes set at the VLA position. We use the measures tool to give us the location of the vla.

---

newsimulator.setfeed - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Set the feed parameters

Synopsis
setfeed(mode)

Description
The goal is to let the feed parameters be specified for each antenna and each spectral window. At this moment, you only have the choice between 'perfect R L' and 'perfect X Y' (i.e., you cannot invent your own corrupted feeds yet). Doesn't need to be run if you want perfect R and L feeds.

Arguments

mode	Mode for specifying feed parameters (currently, perfect only) Allowed String Default: 'perfect R L'

---

newsimulator.setfield - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Set one or more observed fields

Synopsis
setfield(sourcename, sourcedirection, calcode, distance)

Description
Set one or more observed fields, including name, coordinates, calibration code. Can be invoked multiple times for a complex observation. Must be invoked at least once before observe.
If the distance to the object is set then the phase term includes a curvature for the near-field effect at the center of the image.

Arguments

sourcename	Name of source or field (must be specified) Allowed String Default 'unknown'
sourcedirection	Coordinates of source to be observed Allowed MDirection
calcode	Calibration code Allowed String Default ''
distance	Distance to the object Allowed String Default '0km'

Example

```
mysim.setconfig(telescopename='VLA', x=xx, y=yy, z=zz, dishdiameter=diam,
              mount='alt-az', antname='VLA',
              coordsystem='local', referencelocation=dm.observatory('vla'));

mysim.setspwindow(spwname='XBAND', freq='8GHz', deltafreq='50MHz',
                 freqresolution='50MHz', nchannels=1, stokes='RR
                 LL');
dir0 := dm.direction('B1950',  '16h00m0.0', '50d0m0.000')
mysim.setfield(sourcename='SIMU1', sourcedirection=dir0,
              integrations=1, xmospointings=1, ymospointings=1,
              mosspacing=1.0);
mysim.observe('SIMU1', 'XBAND', integrationtime='10s', usehourangle=T,
              starttime='0s', stoptime='3600s',
              referencetime=reftime);
```

---

newsimulator.setmosaicfield - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Set observed mosaic fields

Synopsis
setmosaicfield(sourcename, calcode, fieldcenter, xmosp, ymosp, mosspacing, distance)

Description
Set mosaic fields by internally invoking setfield multiple times.
Currently only handle a rectangular mosaicing pattern. Either
setfield or setmosaicfield must be invoked at least once before
observe.
If the distance to the object is set then the phase term includes
a curvature for the near-field effect at the center of the image.

Arguments

sourcename	Name of source or field (must be specified). Allowed: String Default: 'unknown'
calcode	Calibration code Allowed: String Default: ''
fieldcenter	Coordinates of mosaic field center Allowed: MDirection
xmosp	Number of mosaic pointing in horizontal direction Allowed: Int Default: 1
ymosp	Number of mosaic pointing in vertical direction Allowed: Int Default: 1
mosspacing	Spacing between mosaic pointings Allowed: Quantity Default: '1arcsec'
distance	Distance to the object Allowed: String Default: '0km'

Example

```
mysim.setconfig(telescopename='VLA', x=xx, y=yy, z=zz, dishdiameter=diam,
              mount='alt-az', antname='VLA',
              coordsystem='local', referencelocation=dm.observatory('vla'));

mysim.setspwindow(spwname='XBAND', freq='8GHz', deltafreq='50MHz',
                 freqresolution='50MHz', nchannels=1, stokes='RR
                 LL');
dir0 := dm.direction('B1950',  '16h00m0.0', '50d0m0.000')
```

```
mysim.setmosaicfield(sourcename='SIMU1', fieldcenter=dir0,
                     xmosp=2, ymosp=2, mosspacing='154.5arcsec');
mysim.settimes(integrationtime='10s');
mysim.observe('SIMU1_1', 'XBAND', starttime='0s', stoptime='100s');
mysim.observe('SIMU1_2', 'XBAND', starttime='110s', stoptime='210s');
mysim.observe('SIMU1_3', 'XBAND', starttime='220s', stoptime='320s');
mysim.observe('SIMU1_4', 'XBAND', starttime='330s', stoptime='430s');
```

In this example, a 2x2 mosaic pattern is set centered around the direction specified (dir0). The setmosaicfield name each mosaic field with i sourcename+'_i', where i= 1..4.

---

newsimulator.setspwindow - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Set one or more spectral windows

Synopsis
setspwindow(spwname, freq, deltafreq, freqresolution, nchannels, stokes)

Description
Set one or more spectral windows for the observations, including starting frequency, number of channels, channel increment and resolution, and stokes parameters observed. Can be invoked multiple times for a complex observation. Must be invoked at least once before observe.

Arguments

spwname	Unique user-supplied name for this spectral window Allowed:String Default:'XBAND'
freq	Starting frequency Allowed:Quantity Default:'8.0GHz'
deltafreq	Frequency increment per channel Allowed:Quantity Default:'50.0MHz'
freqresolution	Frequency resolution per channel Allowed:Quantity Default:'50.0MHz'
nchannels	Number of channels Allowed:Int Default:1
stokes	Stokes types to simulate Allowed:String Default:'RR LL'

Example

To simulate a two spectral window (or two IF's in VLA jargon)
data set, use setpwid as follows (here we are simulating 16
channels, 50MHz wide channel for each spectral window)

```
mysim.setspwindow(spwname='CBAND', freq='2GHz', deltafreq='50MHz',
                  freqresolution='50MHz', nchannels=16, stokes='RR LL');

mysim.setspwindow(spwname='SBAND', freq='5GHz', deltafreq='50MHz',
                  freqresolution='50MHz', nchannels=16, stokes='RR LL');
```

Note that the spwname is used in observe to determine which
spectral window is used.

---

newsimulator.setdata - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Set the data parameters selection for subsequent processing

Synopsis
setdata(spwid, fieldid, msselect, async)

Description
This setup tool function selects which data are to be used subsequently. After invocation of setdata, only the selected data are operated on.

Arguments

spwid	Spectral Window Ids (1 relative) to select Allowed:Vector of Ints Default:1
fieldid	Field Ids (1 relative) to select Allowed:Vector of Ints Default:1
msselect	TQL select string applied as a logical "and" with the other selections Allowed:String
async	Run asynchronously in the background? Allowed:Bool Default:!dowait

---

newsimulator.predict - Function

Package synthesis
Module newsimulator
Tool newsimulator

Predict astronomical data from an image

Synopsis
predict(modelImage, complist, incremental)

Description
Predict astronomical data from an image. The (u,v) coordinates already exist, either from a MeasurementSet we have read in or by generating the MeasurementSet coordinates and empty data through create(). We simply predict onto these coordinates.

Arguments

modelImage	Name of image from which to predict visibilities Allowed String Default ''
complist	Name of component list Allowed String
incremental	Add this model to the existing Data Visibilities? Allowed Bool Default F

---

newsimulator.setoptions - Function

Package synthesis
Module newsimulator
Tool newsimulator

Set various processing options

Synopsis
setoptions(ftmachine, cache, tile, gridfunction, location, padding, facets, maxdata)

Description

For most of these, set the options for predict details. See also imager help for more details.

To simulate single dish data, use gridft=SD and gridfunction=PB.

Arguments

ftmachine	Fourier transform machine Allowed:String: 'gridft'|'SD' Default:'gridft'
cache	Size of gridding cache in complex pixels Allowed:Int Default:0
tile	Size of a gridding tile in pixels (in 1 dimension) Allowed:Int Default:16
gridfunction	Gridding function Allowed:String: 'SF'|'BOX'|'PB' Default:'SF'
location	Location used in phase rotations Allowed:position measure
padding	Padding factor in image plane (>=1.0) Allowed:Float Default:1.3
facets	Number of facets Allowed:Int Default:1
maxdata	Maximum data to write to a single TSM file (MB) Allowed:Double Default:2000

Returns
Bool

Example

```
mysim.setoptions(cache=10000000, tile=32,
gridfunction='BOX', dm.location('vla'))
```

---

newsimulator.setvp - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Set the voltage pattern model for subsequent processing

Synopsis
setvp(dovp, usedefaultvp, vptable, dosquint, parangleinc)

Description
Set the voltage pattern model (and hence, the primary beam) used for a Telecope. There are currently two ways to set the voltage pattern: by using the extensive list of defaults which the system knows about, or by creating a voltage pattern description with the vpmanager. The default voltage patterns include both a high and a low frequency VP for the WSRT, a VP for each observing band at the AT, several VP's for the VLA, including the approrpiate beam squint for each observing band, and Gaussian for the BIMA dishes. If you are simulating a telescope which doesn't yet exist, you will need to supply a model voltage pattern using the vpmanager.

Arguments

dovp	Multiply by the voltage pattern (ie, primary beam) when simulating Allowed Bool Default T
usedefaultvp	Look up the default VP for this telescope and frequency? Allowed Bool Default T
vptable	If usedefaultvp is false, provide a VP Table made with vpmanager Allowed Table
dosquint	Activate the beam squint in the VP model Allowed Bool Default T
parangleinc	Parallactice angle increment for squint application Allowed Quantity Default 360deg

Returns
Bool

Example

```
imgr.setvp(dovp=T, usedefaultvp=F,
vptable='MyAlternateVLAPBModel.TAB', dosquint=F);
```

---

newsimulator.corrupt - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Corrupt the data with visibility errors

Synopsis
corrupt()

Description
Add errors specified by the set functions (such as noise, gains, polarization leakage, bandpass, etc) to the synthesis data. This is only visibility-based effects, not image-plane effects such as pointing errors and voltage patterns, which get applied in predict.

Example

```
MSNewsimulator mysim('3C273XC1.MS');
mysim.predict('3C273XC1.FAKE.IMAGE');
mysim.setnoise( mode='simplenoise', simplenoise='0.1Jy');
mysim.setpa( mode='calculate');
mysim.corrupt();
```

---

newsimulator.reset - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Reset the corruption terms

Synopsis
reset()

Description
Reset the visibility corruption terms: this means that corrupt introduces no errors.

---

newsimulator.setbandpass - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Set the bandpasses

Synopsis
setbandpass(mode, table, interval, amplitude)

Description
Set the level of bandpass errors. The error distributions are normal, mean zero, with the variances as specified. (Not yet implemented).

Arguments

mode	Mode of operation Allowed: String: 'calculate'|'table' Default: 'calculate'
table	Name of table Allowed: String Default: ''
interval	Coherence interval e.g. '1h' Allowed: Quantity Default: '1h'
amplitude	Variances errors in amplitude and phase Allowed: 2-Vector of Double Default: [0, 0]

---

newsimulator.setgain - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Set the gains

Synopsis
setgain(mode, table, interval, amplitude)

Description
Set the level of gain errors. The error distributions are normal, mean zero, with the variances as specified.

Arguments

mode	Mode of operation Allowed: String: 'calculate'|'table' Default: 'calculate'
table	Name of table Allowed: String Default: ''
interval	Coherence interval e.g. '10s' Allowed: Quantity Default: '10s'
amplitude	Variances of errors in amplitude and phase Allowed: 2-Vector of Double Default: [0, 0]

---

newsimulator.setleakage - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Set the polarization leakage

Synopsis
setleakage(mode, table, interval, amplitude)

Description
Set the level of polarization leakage between feeds.

Arguments

mode	Mode of operation Allowed String: 'calculate'|'table' Default 'calculate'
table	Name of table Allowed String Default ''
interval	Coherence interval e.g. '5.0h' Allowed Quantity Default '5.0h'
amplitude	Variance of pol leakage amplitude errors; currently, just real Allowed Double Default 0.0

---

newsimulator.setnoise - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Set the noise level

Synopsis
setnoise(mode, table, simplenoise, antefficiency, correfficiency, spillefficiency, tau, trx, tatmos, tcmb)

Description
Set various system parameters from which the thermal (ie, random additive) noise level will be calculated. The noise will vary with dish diameter, antenna efficiency, system temperature, opacity, sky temperature, etc. The noise will increase with the airmass if tau is greater than zero. The noise is calculated according to the *Brown Equation* (ie, R.L. Brown's calculation of MMA sensitivity, 3Oct95):

$$\Delta S = \frac{4\sqrt{2}[T_{rx}e^{\tau A} + T_{atm}(e^{\tau A} - \epsilon_l) + T_{cmb}]}{\epsilon_q \epsilon_a \pi D^2 \sqrt{\Delta\nu \Delta t}} \tag{1.37}$$

Arguments

mode	Mode of operation Allowed String: 'table'|'simplenoise'|'calculate' Default 'calculate'
table	Name of noise table if not simplenoise or not calculated Allowed String Default ''
simplenoise	Level of noise if not Table or not Calculated Allowed Quantity Default '0.0Jy'
antefficiency	antenna efficiency Allowed Float Default 0.8
correfficiency	Correlation efficiency Allowed Float Default 0.85
spillefficiency	Forward spillover efficiency Allowed Float Default 0.85
tau	Atmospheric Opacity Allowed Float Default 0.0
trx	Receiver temp (ie, all non-atmospheric Tsys contributions) [K] Allowed Float Default 50
tatmos	Temperature of atmosphere [k] Allowed Float Default 250.0
tcmb	Temperature of cosmic microwave background [K] Allowed Float Default 2.7

---

newsimulator.setpa - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Corrupt phase by the parallactic angle

Synopsis
setpa(mode, table, interval)

Description
Corrupt phase by the parallactic angle

Arguments

mode	Mode of operation Allowed String: 'calculate'|'table' Default 'calculate'
table	Name of table Allowed String Default ''
interval	Interval for parallactic angle application, e.g. '10s' Allowed Quantity Default '10s'

---

newsimulator.setseed - Function

Package	synthesis
Module	newsimulator
Tool	newsimulator

Set the seed for the random number generator

Synopsis
setseed(seed)

Description

Arguments

seed	Seed Allowed Int Default 185349251
