Chapter 1

ATNF

ATNF-related modules and tools

Description
Package for ATNF-related functionality.

1.1 atca - Module

Module for Australia Telescope Compact Array data processing

Description

This module contains `tools` that are targeted at processing data from the Australia Telescope Compact Array (ATCA). AIPS++ includes many other generic `tools` for processing ATCA data. The tools described below are specific to the ATCA.

Tools

atcafiller	A tool for converting ATNF/ATCA RPFITS files to a MeasurementSet

1.1.1 atcafiller - Tool

Package atnf
Module atca

A tool for converting ATNF/ATCA RPFITS files to a MeasurementSet
include "atcafiller.g"

Description
The `atcafiller` tool is used to convert ATNF/ATCA RPFITS files to AIPS++ MeasurementSets.

Constructors

atcafiller	Construct the ATCA filler tool

Functions

fill	Fill the data
select	Select the data to fill

atcafiller - Constructor

Package	**atnf**
Module	**atca**
Tool	**atcafiller**

Construct the ATCA filler tool

Synopsis
atcafiller(msname, filenames, options, shadow)

Arguments

msname	Filename for MeasurementSet to create Allowed:String Default: ”
filenames	Existing RPFITS files to read; wild cards accepted, don’t use commas Allowed:String or Vector of Strings Default: ”
options	birdie, reweight, noxycorr,compress,fastmosaic,hires Allowed:Vector of Strings Default: ”
shadow	dish size for flagging shadowed data Allowed:Float Default: 22.0

Returns
atcafiller tool

Description

This constructor just creates the filler tool, it does not do any actual filling yet. In the filenames argument commas are not allowed because of the wildcard capability.
The options argument allows for special processing options during the filling process.

birdie remove self generated birdies in 128 MHz data by deleting every other channel and the edge channels

reweight suppress ringing of interference spikes by reweighting the lag spectrum for minimum spectral sidelobe response

noxycorr do not apply the xyphase correction using the noise cal xy phase measurements (use if you know there was a problem with the measurements)

compress Compress the data, model, corrected data and imaging weight columns (may reduce dynamic range)

fastmosaic Produce a MeasurementSet with small tiles to optimize I/O for observations with a large number of pointings and a short time (a few integrations) on each pointing. Failing to use this options for such data may cause very inefficient access, especially for continuum data (10-100 times slower)

hires For data taken in binning mode: set the TIME_CENTROID column to the center of each bin (normally center of integration interval). The TIME column is unaffected. TIME_CENTROID will no longer be in time order for dual frequency mode.

Set the shadow parameter to zero to keep shadowed data. Set it slightly larger than the dish size (22m) if you don't trust data that is almost (geometrically) shadowed.

Example

```
- rpf := atcafiller('myms',
  "/data/RPFITS/1999-01-01_0101.C999 /data/RPFITS/1999-01-01_0202.C999",
  "birdie reweight", 22.5, F);
```

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atcafiller.fill - Function

Package	**atnf**
Module	**atca**
Tool	**atcafiller**

Fill the data

Synopsis
fill()

Description

This function does the actual filling of the data from rpfits format files to a MeasurementSet. After the completion of the fill operation you should call the done method to avoid problems with incomplete flushing of the data to disk. You may want to run select before fill, to reduce the amount of data you read in.

Returns
Bool

Example
Fill the data from files 1999-01-01_0101.C999 and 1999-01-01_0202.C999 in the directory /data/RPFITS into the MeasurementSet myms.

```
- rpf := atcafiller('myms',
  "/data/RPFITS/1999-01-01_0101.C999 /data/RPFITS/1999-01-01_0202.C999");
- rpf.fill();
- rpf.done();
- myms:=ms('myms');
- myms.nrow();
1204
- myms.close();
```

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atcafiller.select - Function

Package	**atnf**
Module	**atca**
Tool	**atcafiller**

Select the data to fill

Synopsis
select(firstscan, lastscan, lowfreq, highfreq, freqchain, fields, bandwidth1,

numchan1)

Arguments

firstscan	first scan to read Allowed:Positive Int Default: 1
lastscan	last scan to read Allowed:Positive Int Default: 9999
lowfreq	lowest reference freq to select in GHz Allowed:Double Default: 0.1
highfreq	highest reference freq to select in GHz Allowed:Double Default: 1000.0
freqchain	select one of the simultaneous frequencies, 0=both Allowed:Int Default: 0
fields	list of field names (sources) to select Allowed:Vector of Strings Default: "
bandwidth1	select on bandwidth (MHz) of the first frequency chain, 0=all Allowed:Int Default: 0
numchan1	select on number of channels in first frequency chain, 0=all Allowed:Int Default: 0

Description

Select on various items, to load only a subset of the data present in the input file. The default is to load everything. Note that the frequency selection using lowfreq and highfreq acts purely on center (reference) frequencies, channel selection is not available at this stage. Use freqchain to select the frequency chain (or IF) to load, specify either 1 or 2, the default of zero will load both. Use the fields parameter to specify a list of field names (sources) you want to load. For detailed selection of complex observations the last two parameters let you specify the required bandwidth (in whole MHz) and number of channels of the first frequency chain.

Returns

Bool

Example
Select scans 4 to 10 inclusive, frequency chain 1, all data with a reference frequency of more than 1.4 GHz.

```
- rpf := atcafiller('myms', '/data/RPFITS/1999-01-01_0101.C999');
- rpf.select(firstscan=4, lastscan=10, freqchain=1, lowfreq=1.4)
- rpf.fill();
- rpf.done();
```