

Miriad for SMA

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Goal:

- *Convert SMA data into Miriad environment*
- *Provide specific tools for calibrations and data handling for SMA interferometer data*
- *Support Miriad-software for end-to-end SMA data reduction*
- *Users: **Scientists** for research
Engineers for data inspection and quality assurance*

Major Development

- **May 2004 to January 2008:**

For the standard SMA data (2GHz BW/sb), the Miriad package (4.1.3) with the SMA components has been well tested, and widely accepted by the SMA users' community

- *for the reduction of continuum, spectral line, & polarization data*
- *from loading, editing, calibration, & imaging*
- *the only path to reduction of SMA polarization data*

- **SMA-components:**

- 1) *SMA subs in .for and .c for handling i/o interfaces between SMA & Miriad formats*
- 2) *Twenty-two SMA Tasks (.for) for supporting SMA data handling and calibrations*
- 3) *Molecular line catalog (JPL) adopted in **smauvspec** for line identifications*

*Planet models adopted in **smaflux** for bootstrapping flux density scale from planets*

- **The sub-package: archived in Miriad-CVS (no changes since Jan. 2008).**
- **Online support – <http://www.cfa.harvard.edu/sma/miriad>**
- **Online users' guide – <http://www.cfa.harvard.edu/sma/miriad/manuals>**

- **July 2009 to present:**

The newly formatted SMA data (for IF/correlator upgrade) cannot be read with simple repairs in the standard SMA Miriad software for both DB (4GHz BW/sb) and SB (2GHz BW/sb).

- ***Patches for new SMA formatted data have been developed and released as a Beta test on the basis of Miriad-CVS (4.1.3)***
- ***A total of 13 releases have been made***
 - First Beta release: beta 1.0.0 2009-11-27***
 - Latest Beta release: beta 1.1.2 2010-10-18***

Major changes are made in two patches in c code:

- 1) read the new SMA formatted data for double band (4GHz/sb) with a total of 49 spectral windows from two IFs, converting to Miriad***
- 2) read the dual receiver data from the new online codes for single band (2GHz/sb), converting to Miriad***
- 3) lower level i/o subs (.c and .for) for new SMA ancillary data, such as the new Tsys table, information files in the data dir (modelInfo, projectInfo, codeVersions), the new byte-order swap routine and etc***

Minor changes (many) for the further incompatibility problems:

- 1) users' interface TASK routines due to the increase of the number of spectral windows***
- 2) handling ch0 (the online average of all spectral channel data) for some user groups***
- 3) incompatibility of newly updated Miriad Task (e.g. [uvsplit](#)) for handling SMA data***

- **Beta test site**

<http://www.cfa.harvard.edu/sma/miriad/download>

- **Debugging for scientific uses**

- *Created a bug-report system*
- *Received 15 reports*
- *Limited success in communication with users*
- *Helped debugging the Beta on Linux from installation, data loading, editing, calibration to imaging*
- ***Beta on Linux is now running for SMA science as reported from some users***
- *The platform dependence seems to be still an issue, particularly for Mac users*

- **Applications**

- *The Beta release has been used for SMA engineering data pipeline for data quality check*

- **Current activity**

- *Upgrade SMA Beta codes from Miriad-CVS (4.1.3) (Nov. 2009) to the current version (4.1.5 or 4.1.7) on Linux-OS (RH & FC)*
- *Fix problems of incompatibility with the UV i/o updated in the Miriad subs in the past year, preparing for merging*
- *Fix problems in compilation on Mac-OS (purchasing a Mac computer)*

- **Next step: Merging back to Miriad- CVS (*formal release*)**
- **Prospects:**
 - *Fix some of the platform dependence problems with help from outside Miriad developers and users*
 - *Fix any compatibility problems in the updated SMA tasks with rest of the world*
 - *Get more constructive feedbacks from the larger users' community for improvement*
- **Concerns:**
 - *Increasing number of Mac's users but so far the Beta only tested on Linux*
 - *Inadequate feedbacks from SAO scientists*
 - *Inadequate information from the real-time software/testing crew for any changes in the online system*
 - *No prompt testing data/testing time for offline software test while the real-time system changes*
 - *Multiple paths: Miriad formatted SMA data from IDL-output –*
 - Pro:** *quickly get the IDL script working; reduce pressure on Miriad developer.*
 - Con:** *confusion to both users using Miriad and support staff in supporting SMA Miriad users; often users' problems of breaking down Miriad software caused by incorrect variables and incompatibility (old mirlib) of the IDL-output*