SOFIA-SPOT (SSPOT):
The SOFIA AOR Editor

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Introduction

- From the GI perspective, observation planning for SOFIA is composed of two parts:
  - Phase I: Proposal Preparation (SPT, SITE, VT)
  - Phase II: AOR creation/modification (SSPOT)
- Early decision not to force GIs to create AORs as part of the proposal process.
- Trade study of existing Obs Planning tools was conducted in 2001: included *Spitzer* SPOT and the Gemini OT.
- Trade study reviewed in 2009; decision was made by SMO director and ISD manager to use a version of *Spitzer* SPOT as the Phase II planning tool for SOFIA.

SOFIA-SPOT (SSPOT)

- During Phase 2 observation planning, GIs will use **SOFIA-SPOT** to specify an observing strategy and detail their AORs.

- Developed by Lan Lin, with assistance from Trey Roby (IPAC) and input from W. Vacca and Instrument Scientists

- Features:
  - Detailed AOR editor with constraints and validation
  - Support for multiple AOTs as defined by SI teams
  - AOR visualization with SI FOVs on image background, including SOFIA specific constraints (e.g. chopping secondary limits)
  - Interface with existing archives (2MASS, IRAS, MSX, etc…)
  - Observation duration estimate, including overheads
  - Integrated with DCS planning database and proposal system
  - Help pages, example AORs, and sample images are available

SSPOT has undergone verification and validation testing within SOFIA Science Center. Comments and suggested modifications from science staff incorporated. A beta version was distributed to the SI teams and SUG in April 2012 – no comments received.

SSPOT cont.

- AOT specification worked out with SI representatives for each mode, including:
  - Options
  - Constraints
  - Parameters
  - Value ranges and defaults
- AOT/AOR visualization validated with SI representatives
- 8 AOTs offered in SSPOT for Cycle 1 for FORCAST, GREAT, and FLITECAM
- SSPOT generates an XML file as output that can then be parsed/translated into scripts that control the SI during the observations
  - Work on translator is underway

Cycle 1 AOTs Supported

- 8 AOTs offered in SSPOT for Cycle 1:

    FORCAST Imaging (NMC, NPC, C2NC2)

    FORCAST Grism (NMC, NPC, C2NC2)

    FORCAST Grism XD

    GREAT Single Point (Total Power, Beam Switch)

    GREAT Raster Mapping

    GREAT OTF Mapping

    FLITECAM Imaging (STARE, Nod Off Array)

    FLITECAM Grism (Nod Along Slit, Nod Off Slit)

Cycle 1 User Experience

- SSPOT is online and available for download from the DCS website:
  - https://dcs.sofia.usra.edu/
- After receiving Phase 2 instructions, GI downloads SSPOT and installs to local desktop.
- GI uses SSPOT to log in to the DCS and download proposal data.
- "Draft" AORs are generated automatically by SSPOT
- GI completes/modifies AORs using visualization features to achieve science goals.
- AORs can be uploaded to the DCS for safekeeping at any time.
  - AORs stored in the DB
  - Key values are parsed; support staff can view AORs and compare to original proposal
- GI makes final uploads before Phase 2 deadline.
- After deadline, the GI may download and view AORs, but cannot upload unless SMO staff indicates that there is a problem.
- **Sept. 2012**: Cycle 1 Phase 2 planning begun; instructions sent to GIs; some AORs already received

Stratospheric Observatory For Infrared Astronomy

SOFIA Planning Tool

Astronomical Observation Requests (AORs)

Label	Target	Position	Type	Instrument	Duration	Stat
01_0431_1	LkHalpha 101	4h30m14.39s...	Fixed Single	FORCAST_Imaging	1215	new
01_0431_2	LkHalpha 101	4h30m14.39s...	Fixed Single	FORCAST_Imaging	1215	new
01_0431_3	LkHalpha 101	4h30m14.39s...	Fixed Single	FORCAST_Imaging	1215	new
01_0431_4	MWC 137	6h18m45.52s...	Fixed Single	FORCAST_Imaging	385	new
01_0431_5	MWC 137	6h18m45.52s...	Fixed Single	FORCAST_Imaging	385	new
01_0431_6	MWC 137	6h18m45.52s...	Fixed Single	FORCAST_Imaging	385	new
01_0431_7	MWC 147	6h33m05.19s...	Fixed Single	FORCAST_Imaging	385	new
01_0431_8	MWC 147	6h33m05.19s...	Fixed Single	FORCAST_Imaging	385	new
01_0431_9	MWC 147	6h33m05.19s...	Fixed Single	FORCAST_Imaging	385	new
01_0431_10	MWC 297	18h27m39.51...	Fixed Single	FORCAST_Imaging	385	new
01_0431_11	MWC 297	18h27m39.51...	Fixed Single	FORCAST_Imaging	385	new
01_0431_12	MWC 297	18h27m39.51...	Fixed Single	FORCAST_Imaging	385	new
01_0431_13	BD+40 4124	20h20m28.24...	Fixed Single	FORCAST_Imaging	385	new
01_0431_14	BD+40 4124	20h20m28.24...	Fixed Single	FORCAST_Imaging	385	new
01_0431_15	BD+40 4124	20h20m28.24...	Fixed Single	FORCAST_Imaging	385	new
01_0431_16	MWC 1080	23h17m25.59...	Fixed Single	FORCAST_Imaging	385	new
01_0431_17	MWC 1080	23h17m25.59...	Fixed Single	FORCAST_Imaging	385	new
01_0431_18	MWC 1080	23h17m25.59...	Fixed Single	FORCAST_Imaging	385	new
01_0431_19	HD 37903	5h41m38.39s...	Fixed Single	FORCAST_Imaging	1215	new
01_0431_20	HD 37903	5h41m38.39s...	Fixed Single	FORCAST_Imaging	1215	new
01_0431_21	HD 37903	5h41m38.39s...	Fixed Single	FORCAST_Imaging	1215	new
01_0431_22	HD 200775	21h01m36.92...	Fixed Single	FORCAST_Imaging	1215	new
01_0431_23	HD 200775	21h01m36.92...	Fixed Single	FORCAST_Imaging	1215	new
01_0431_24	HD 200775	21h01m36.92...	Fixed Single	FORCAST_Imaging	1215	new

Observations

Target: **LkHalpha 101** *Type:* **Fixed Single**   *Estimated:* **278 min** *Awarded:* **400 min**

Existing Project – sofia_forcast.aor   Net Up   Total AORs: 24 / Active: 24

FORCAST_Imaging

Unique AOR Label: 01_0431_1

Target: **LkHalpha 101** *Type:* **Fixed Single**
67.559960, 35.273415 Equ J2000   *or*   4h30m14.39s, +35d16m24.3s Equ J2000

New Target   Modify Target...   Target List...

Observing Condition   Aquisition/Tracking

FORCAST

Exposure Time (sec)   240.000

Cycles   1

Min Contiguous Exp Time (sec) 0.000

SW
- FOR_F064
- FOR_F066
- FOR_F077
- FOR_F111
- FOR_F197
- FOR_F242
- NONE

LW
- FOR_F315
- FOR_F336
- FOR_F348
- FOR_F371
- NONE

Chop / Nod

Chop/Nod Style   C2NC2

Chop Type   Asym

Chop Throw (arcsec)   300.000

Chop Angle Coordinate   Sky

Set Chop Angle Ranges

Chop Angle (deg) 90.000

Nod Throw (arcsec)   300.000

Nod Angle Coordinate   Sky

Nod Angle (deg)   190.000

Example Rotation Angle (deg)   30.000

Dither Pattern

No   Yes   Set Dither Pattern

Observation Est...   Comments...   Open Visibility Tool...   Proposal Info...

Cancel   Apply   OK

FORCAST Imaging C2NC2

FORCAST Imaging C2NC2

FORCAST Grism C2NC2

GREAT OTF Mapping/Total Power

Known Issues

- SSPOT currently does not support overlays for non-sidereal targets.

- Rotation of Field (ROF) depends on flight plan and hence cannot be specified in SSPOT during Phase 2.

  - GIs can explore impact of ROF on observations using the "Example Rotation Angle" parameter.

  - Slit position angle cannot be specified by GI during Phase 2 planning of spectroscopic (grism) observations

  - *Any required constraints must be communicated to the GI's Support Scientist in the "Comments" section.*

- ***We are working bugs as we uncover them, but in general SSPOT works well.***

  - Bug fixes incorporated into latest releases and distributed to GIs via built-in auto-update feature