Southern Hemisphere Deployment Plans

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2015 Deployment

SOFIA Deployment 2015
- OC3-D FORCAST
- OC3-E FLIPO
- OC3-F FORCAST
- OC3-G GREAT

SOFIA Users’ Group 18 November 2015

Ryan Hamilton
Assumptions

• Two instruments to be taken on deployment
  – For the Cycle 3 Southern Hemisphere deployment, SOFIA developed the capability to ship one of the instruments on the airplane with the other instrument mounted on the Telescope Assembly
  – Instrument changes demonstrated in Christchurch demonstrated during Cycle 3

• Instrument Selection Criteria
  – Demand from the Cycle 4 Proposal Call
  – Benefit of Southern Hemisphere to selected program
    • Observing conditions
    • Scheduling efficiency
Difference between winter in Christchurch vs. summer in Northern Hemisphere results in ~20x difference in integration time.
SI Shipping Fixture

Photo taken on 20 April 2015

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Cycle 4 High Priority Selections

- Observations that *require* observations from Southern Hemisphere
  - FORCAST - ~70 hours
  - FIFI-LS - ~45 hours
  - GREAT - ~17 hours
  - EXES, FLITECAM, and HIPO had negligible demand for Southern Hemisphere targets
  - HAWC+ was not considered since it would not be commissioned in time for the deployment

- Based on the demand, FORCAST and FIFI-LS were selected for the deployment
Three-Instrument Option

• Considered option of 3-instrument complement for Southern Hemisphere deployment
  - Cycle scheduler examination of GREAT targets found significantly higher scheduling success rate for 3-instrument version because of the high concentration of GREAT targets in the southern skies
  - Some highly ranked GREAT investigations are enabled
  - Shifting GREAT observations to the deployment opened up the possibility of shifting the May Maintenance/Upgrade period before the HAWC+ Part 1 commissioning
    • Provides ~1 month of extra schedule for HAWC+
    • This variant of the schedule is not currently proposed, but is a possibility.
• Option under detailed investigation has fewer flights (103 vs. 106.5), but sky visibility for GREAT Southern Milky Way is much better, resulting in more high priority hours.
<table>
<thead>
<tr>
<th>PropID</th>
<th>TAC Queue</th>
<th>Title</th>
<th>PI</th>
<th>Institution</th>
<th>Instruments</th>
<th>Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>04_0101</td>
<td>US</td>
<td>Measuring the Outflows from Massive Young Stellar Objects in the Large Magellanic Cloud (LMC)</td>
<td>Meixner, Margaret</td>
<td>STSci</td>
<td>GREAT</td>
<td>N159W (5.7, -70) N79-YSO (4.9, -69)</td>
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<tr>
<td>04_0082</td>
<td>US</td>
<td>Large Magellanic Cloud observed by SOFIA/GREAT</td>
<td>Israel, Frank</td>
<td>Leiden</td>
<td>GREAT</td>
<td>LMC-N15 (5.0, -66) LMC-N197 (5.3, -72) LMC-N68 (5.6, -68) LMC-N87 (4.9, -69)</td>
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<tr>
<td>04_0041</td>
<td>DE</td>
<td>Molecular excitation of a strongly irradiated pillar in the Carina Nebula</td>
<td>Preibisch, Thomas</td>
<td>Universitats-Sternwarte Munchen</td>
<td>GREAT</td>
<td>Pillar Position 1 Pillar Position 2 Pillar Position 3 (10.8h, -60)</td>
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<tr>
<td>04_0095</td>
<td>DE</td>
<td>Ammonia as a probe of infall in high-mass star forming clumps, Part III</td>
<td>Wyrowski, Friedrich</td>
<td>Max-Planck-Institut fur Radioastronomie</td>
<td>GREAT</td>
<td>AG337.17-0.03 AG337.26-0.10 AG337.29+0.01 AG337.70-0.05 AG351.16+0.7 AG351.44+0.6 AG351.77-0.5</td>
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<tr>
<td>04_0104</td>
<td>DE</td>
<td>Far-IR cooling in massive YSOs</td>
<td>Leurini, Silvia</td>
<td>Max Planck Institut fuer Radioastronomie</td>
<td>GREAT</td>
<td>AG337P17 AG337P26 AG337P29 AG337P70 AG351P16 AG351P25 AG351P42 AG351P44 AG351P77</td>
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# Alternate Schedule

<table>
<thead>
<tr>
<th>JAN</th>
<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
<th>JUL</th>
<th>AUG</th>
<th>SEP</th>
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</thead>
<tbody>
<tr>
<td>FORCAST</td>
<td>FIFI-LS</td>
<td>EXES</td>
<td>HAWC+</td>
<td>GREAT</td>
<td>Main</td>
<td>FIFI</td>
<td>FIFI-LS</td>
<td>FORCAST</td>
</tr>
</tbody>
</table>

**Alternate**

| FORCAST | FIFI-LS | EXES | HAWC+ | Main | GREAT | GREAT | FORCAST | FIFI-LS | HAWC+ | HAWC+ | Main | FORCAST |

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Impacts and Costs Being Investigated

- Deployment time is extended by 1 week
- Shipping fixture for 3rd instrument
- Logistical support for upGREAT
- Maintenance/upgrade readiness for March 2016
- Overall cost of option
FORCAST and FIFI-LS Shipping Concept
Impacts and Costs Being Investigated

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- Shipping fixture for 3\textsuperscript{rd} instrument
- Logistical support for upGREAT
- Maintenance/upgrade readiness for March 2016
- Overall cost of option

- Expect final decision by end of year