Plans Cal/Val Phase I release

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Soil Moisture
Active Passive
Mission

SMAP

Cal/Val Workshop 6
September 1-3, 2015

Caltech
Pasadena, CA
Various calibration issues

- There are various terms that go into the radiometer calibration – many of which are interconnected

\[ T_{ap} = G_{pp} \left( \eta_v T_{ATOI_p} + (1-\eta_v) T_{Bblp} + \chi_{pq} T_{ATOI_q} + \chi_{ps} T_{ATOIs} + \chi_{pr} T_{ATOIs} \right) + O_p + f(T_{Dsun}, T_{Rsun}, T_{Dgal}, T_{Rgal}, T_{Dmoon}) \]

1. Gain calibration
   1. Noise-diode calibration
2. Offset calibration
   1. Front-end calibration
2. Radome
3. Reflector
3. Antenna Pattern Correction
   1. Spillover correction
   2. Cross-pol matrix correction
4. Reflected/Direct contribution
   1. Sun
   2. Galaxy
   3. Atmosphere
5. Faraday rotation correction
6. Geolocation correction
7. Sub-band calibration
8. RFI threshold
   1. Kurtosis Fullband
   2. Kurtosis Subband
   3. Cross Frequency
   4. Pulsed Detection
   5. 3\textsuperscript{rd}/4\textsuperscript{th} Stokes
9. Internal Cal check
   1. NEDT check
   2. Flagging check
10. TA drift calibration
<table>
<thead>
<tr>
<th>Calibration Issue</th>
<th>Things to do</th>
<th>Person(s) in-charge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relative calibration and Front-end Loss correction</strong></td>
<td>Implement high resolution reflector/radome table</td>
<td>Sid, Jinzheng, Priscilla</td>
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<td>Assess drift observed during eclipse period</td>
<td>Sid, Jinzheng</td>
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<td>Update reflector/radome loss</td>
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<td></td>
<td>Relative CSC/ocean/Antarctica/Land TA comparison</td>
<td>Sid, Jinzheng, Emmanuel</td>
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<td>Drift readjustment</td>
<td>Jinzheng</td>
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<td><strong>Absolute calibration</strong></td>
<td>APC spillover correction</td>
<td>Emmanuel</td>
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<tr>
<td></td>
<td>Absolute CS/ocean/Land comparison</td>
<td>Emmanuel, Jinzheng, Sid</td>
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<td></td>
<td>Gain/Offset readjustment</td>
<td>Jeff, Joel, Rajat</td>
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<tr>
<td><strong>Algorithmic correction</strong></td>
<td>Galactic correction readjustment</td>
<td>Giovanni, Jeff,</td>
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<td>Sun-glint correction readjustment</td>
<td>Thomas</td>
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<td><strong>Polarization correction</strong></td>
<td>APC cross-pol contamination</td>
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<td></td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; Stokes calibration</td>
<td>David</td>
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<td>4&lt;sup&gt;th&lt;/sup&gt; Stokes calibration</td>
<td>Jeff</td>
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<tr>
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<td>RFI threshold 3&lt;sup&gt;rd&lt;/sup&gt;/4&lt;sup&gt;th&lt;/sup&gt; Stokes</td>
<td>Joel, Priscilla</td>
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<tr>
<td><strong>Other issues</strong></td>
<td>Gain filter change</td>
<td>Sid</td>
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</tbody>
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Validation Phase I release

• Validation process
  – SMOS/Aquarius/Dome-C comparisons
  – Evaluate individual error-budget terms
    • Some are easier than others to evaluate
  – Validation process different for land, ocean, ice
• Inputs to SDS – end of September – one month away!!
• Data release – end of October