Comparison of Aquarius measurements and simulations

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Comparisons of measured antenna temperatures and simulated ones to assess:

- Calibration bias over ocean scenes
- Calibration drift over ocean scenes
- Calibration over Cold Sky
Calibration bias over ocean scenes

Ta, beam 1, measured and expected during 1 orbit on: 22 Aug, 01:43-03:40

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- average difference $\Delta T_a$ expected – measured => calibration bias + model bias
- Standard deviation => model error in T, SSS, WS dependence + uncertainty on ancillary parameters
Example of early report on bias/std (08/31/2011)

reprocessed with better ancillary data
Bias <Data-Model>
std (Data-Model)
Calibration over cold sky

5 pseudo cold sky maneuvers have occurred from Aug, 25 to Nov, 08
‘Pseudo’ cold sky maneuver => over land
Maneuver over land => RFI

Black curve – L2 data
Red curve – simulated Ta

Beam 3
Maneuver over land => RFI

Black curve – L2 data
Red curve – simulated Ta

Beam 3
Bias model/data

Red curve – simulated Ta
Green curve – simulated Ta shifted by a constant bias

Accounting for a constant bias, model and simulation appear in good agreement (except for 1\textsuperscript{st} maneuver on Sept 15\textsuperscript{th})
Biases derived from comparison with pseudo cold sky signal

<table>
<thead>
<tr>
<th></th>
<th>V-pol</th>
<th>H-pol</th>
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</thead>
<tbody>
<tr>
<td>Beam 1</td>
<td>-1.60</td>
<td>0.43</td>
</tr>
<tr>
<td>Beam 2</td>
<td>-3.13</td>
<td>-0.23</td>
</tr>
<tr>
<td>Beam 3</td>
<td>-5.42</td>
<td>1.16</td>
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</tbody>
</table>
Limitation due to maneuver over land

Green curve – simulated Ta component due to Earth surface emission

=> Large variability in the calibration target due to land/ice emission, not accurately known