Aquarius Scatterometer Calibration and RFI Status

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Amazon $\gamma_0$ $\gamma_0 = \frac{\sigma_0}{\cos(\theta_{inc})}$

- PALSAR found $\gamma_0$ values in the Amazon stable across 20-45 degrees in incidence angle*
  - Wet-dry seasonal difference of $\sim 0.27$ dB**
  - Wet season is approx. Nov-April.
- Best estimates are:
  - HH $\sim -6.28$ dB (std 0.18)
  - HV $\sim -11.15$ dB (std 0.21)
  - Not clear which season this is from!

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RAP correction is range antenna pattern correction
Regions used in $\gamma_0$ Analysis
Include data in blue polygon that not in black polygon
PALSAR Found $\gamma_0^{\text{HH}} = -6.28$ dB and $\gamma_0^{\text{HV}} = -11.15$ dB

Histograms of Aquarius $\gamma_0$ For the Three Beams
### Bias compared to PALSAR

**PALSAR values:** HH: -6.28 dB; HV: -11.15 dB

<table>
<thead>
<tr>
<th>Asc / Dec</th>
<th>Beam 1</th>
<th>Beam 2</th>
<th>Beam 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>All HH</td>
<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
</tr>
<tr>
<td>Ascending HH</td>
<td>0.03</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>Descending HH</td>
<td>-0.03</td>
<td>0.01</td>
<td>0.13</td>
</tr>
<tr>
<td>All VV</td>
<td>-0.05</td>
<td>0.01</td>
<td>0.07</td>
</tr>
<tr>
<td>Ascending VV</td>
<td>-0.03</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>Descending VV</td>
<td>-0.08</td>
<td>0.03</td>
<td>0.06</td>
</tr>
<tr>
<td>All HV</td>
<td>0.04</td>
<td>0.14</td>
<td>0.07</td>
</tr>
<tr>
<td>Ascending HV</td>
<td>0.07</td>
<td>0.13</td>
<td>0.03</td>
</tr>
<tr>
<td>Descending HV</td>
<td>0.02</td>
<td>0.16</td>
<td>0.13</td>
</tr>
</tbody>
</table>

*No significant ascending / descending difference*
Overall Bias: \(-0.036\)
Overall STD: 1.149
CAP Speed compared to SSMI/S

Overall Bias: 0.165
Overall STD: 1.046
Wind Speed Bias/STD as compared to SSMI/S

- Bias/STD [m/s]

- Scat Bias
- Scat STD
- CAP Bias
- CAP STD

2012 - 2015
RFI Flag is 10 or 11

2 or more samples of 8 removed from the block average

H-Pol Severe RFI SCAT_Flag Count For 2012

stdev = 21.020  avg = 11.061
RFI Flag is 10 or 11
2 or more samples of 8 removed from the block average

H-Pol Severe RFI SCAT_Flag Count For 2013

stdev = 22.161  avg =  11.723
RFI Flag is 10 or 11
2 or more samples of 8 removed from the block average

H-Pol Severe RFI SCAT_Flag Count For 2014

stdev = 21.851  avg = 11.578
Summary

• Aquarius continues to provide a well-calibrated source of L-band backscatter
  – It has been extremely stable over 3 years of operation
  – It will provide a reference calibration for new missions such as SMAP

• Aquarius has proven an L-band scatterometer can provide quality ocean winds

• Aquarius scatterometer RFI mitigation statistics did not change much from 2013 to 2014, but there was some large change in the western US from 2012 to 2013.