**Summary**

The Aquarius L-band radiometer/scatterometer system is designed to provide monthly salinity maps at 150 km spatial scales to an accuracy of 0.2 psu. The sensor was launched on June 10, 2011, aboard the Argentine CONAE SAC-D spacecraft. The L-band radiometers and the scatterometer have been taking science data observations since August 25, 2011.

This poster summarizes the major steps of the Aquarius Level 2 salinity retrieval algorithm that is run by the Aquarius Data Processing System ADPS and improvements that are currently in progress:

1. Version 2.0 that is currently implemented uses wind speed fields from the NCEP GDAS Numerical Weather prediction model in order to correct for the roughness of the ocean surface. The roughness correction can be significantly improved by using wind speed fields that are derived from the Aquarius L-band scatterometer.

2. Version 2.0 exhibits biases between the retrieved salinities of the ascending and descending swaths by more than 1.5 psu, which vary with season and location. Most of them can be traced to the correction for the galactic radiation that is reflected from the ocean surface. Adding a small empirical adjustment to this correction reduces the ascending – descending biases significantly.

3. In-situ validation of the Aquarius SSS against drifting buoys shows that with the planned algorithm improvements Aquarius meets its mission requirements of 0.2 psu accuracy for temporal - spatial averages of 1 month and 150 km.

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**Basic Algorithm Flow**

**Improved Surface Roughness Correction**

Optimized combination of radiometer and scatterometer channels for wind speed and salinity retrievals

**Ascending/Descending Biases – Galactic Radiation**

The reflection of galactic radiation at the ocean surface is modeled by tilted facets (geometric optics).

The computation involves a 4-fold integration over wave slopes and antenna patterns.

**In-Situ Validation**

PMEL buoys: TAO, TRITON, PIRATA, RAMA

Daily salinity measurements at 1m depth. Map shows location and number of months.

**Triple collocation statistics for monthly 150 km averages (RMS values [psu])**

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<thead>
<tr>
<th>Data Source</th>
<th>RMS Value [psu]</th>
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<tbody>
<tr>
<td>Aquarius - HYCOM</td>
<td>0.254</td>
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<tr>
<td>Aquarius – Buoy</td>
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<td>HYCOM - Buoy</td>
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<td>Buoy</td>
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</tbody>
</table>

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**Data available at:** [ftp://Aquarius:saltyH2O@aq.remss.com](ftp://Aquarius:saltyH2O@aq.remss.com)