Validation of Aquarius and SMAP Sea-Surface Salinity in the Tropics

Level-2 Sea-Surface Salinity (SSS) retrievals from Aquarius (Version 4.6.1) and SMAP (Version 3.0) are evaluated. They are compared with in-situ observations. Evaporation (E) and precipitation (P) fields from MERRA-2 are used to delineate between well mixed (red) and rainy (blue) regions. Results are shown for the Tropical Pacific Ocean.

The main features are:

- SSS and in-situ data agree quite well when evaporation dominates – in these conditions the upper ocean is well mixed;
- Agreement is not as good when precipitation dominates – in this case there is a thin layer of fresh water above a well-mixed layer, so the SSS is expected to diverge from the in-situ data from ~5 meters below the surface; and
- SSS estimated from SMAP V3.0 retrievals is of lower quality than Aquarius V4.6.1, showing opportunities for further algorithm developments.