

## Comparison of SST estimates by AVHRR Sensor and floats of PIRATA program in the Equatorial Atlantic Ocean

Pereira B. G ; Ferreira A. G

Oceanographer, Master in Geography [brunoscience@hotmail.com](mailto:brunoscience@hotmail.com)

Universidade Federal do Ceará, Instituto de Ciências do Mar

The Sea Surface Temperature (SST) on Atlantic Ocean is one important component of the climate variability in region northeastern of Brazil because the dynamics of the coupled processes on air-sea interface characterizes the rainfall system in the Equatorial region with movement of ICZT. The PIRATA Project (Prediction and Research Moored Array in the Atlantic) was created in 1997 for the acquisition of oceanographic and meteorological data for monitor ocean-atmospheric interactions in this Tropical Atlantic Ocean using 21 fixed buoys in along Atlantic Ocean in 20 N - 20 S (fig.1).

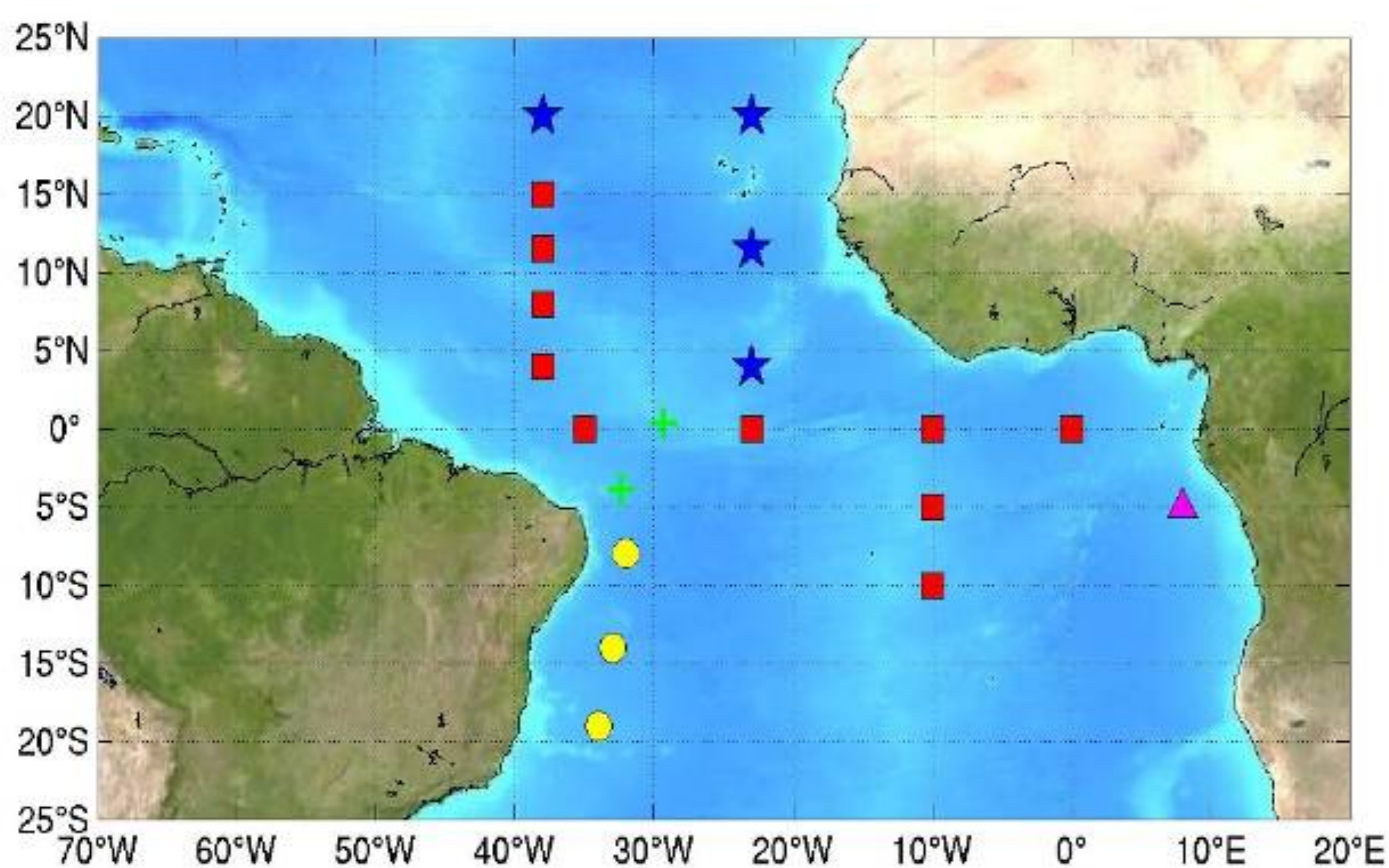


Figure 1 : Geographic distribution of 21 fixed floats of PIRATA program along the Atlantic Ocean. (RIBEIRO, 2011)

This study is one efforts for evaluate accuracy of daily spacial measurements obtained from the Advanced Very High Resolution Radiometer – AVHRR sensor on board of NOAA satellite. For compare the SST data we use the sample of time series measurements by 15 PIRATA fixed floats project along the years 2007 to 2017. The AVHRR data is obtaneid using time serie data analyses tool of SatCO2 software for import satellite data using geographic coordinates of PIRATA fixed floats. The satellite data were extracted at a resolution of 25 km were correlated from Pearson correlation coefficient, standard deviation, and chi-square. (fig 2, 3, e 4).

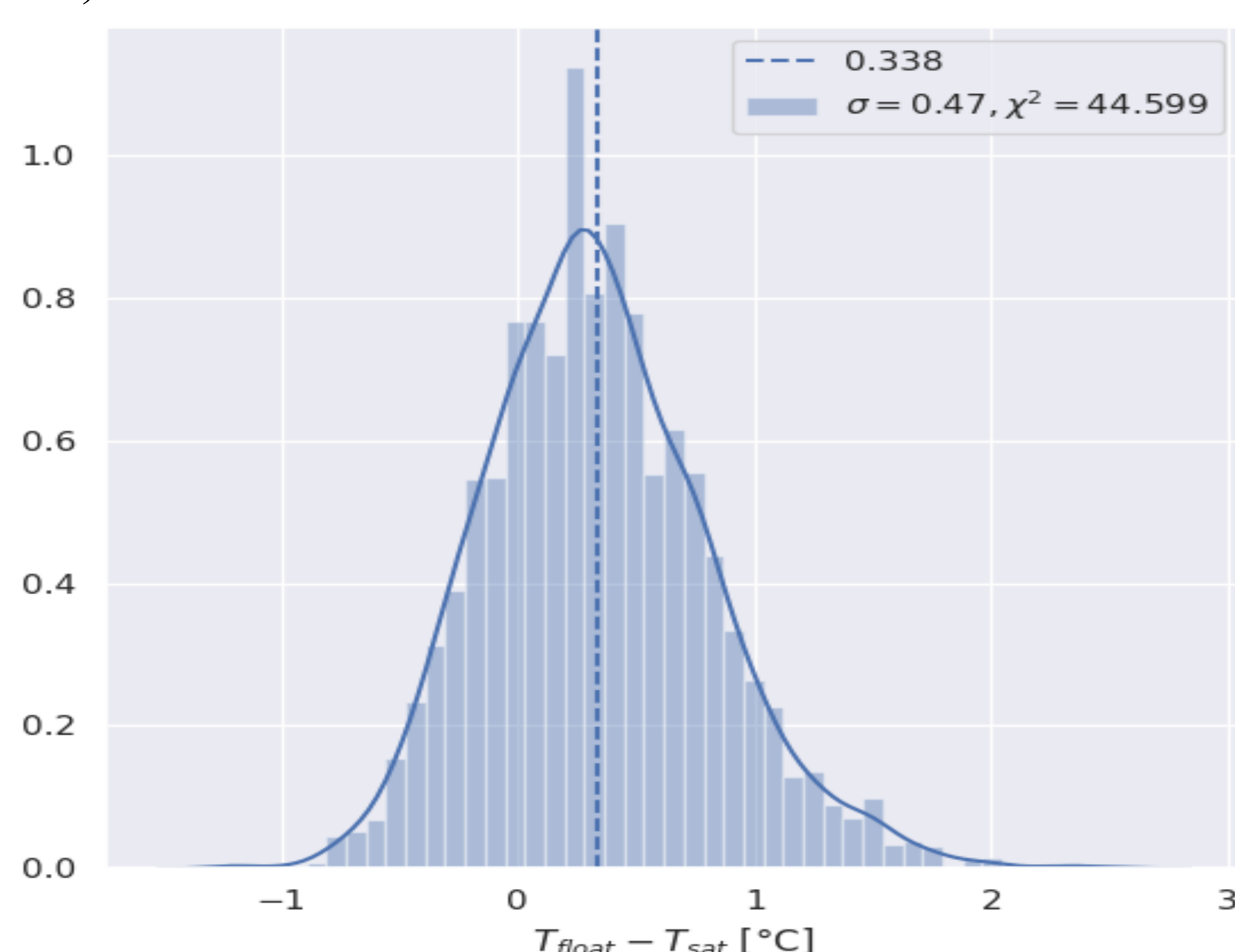


Figure 2: The total of 318.066 temperature data were analyzed using statistical tools through the Python language. The mean standard deviation and showed excellent correlation indications between the spatial data of 25 km of solving and the data collected in situ by buoys

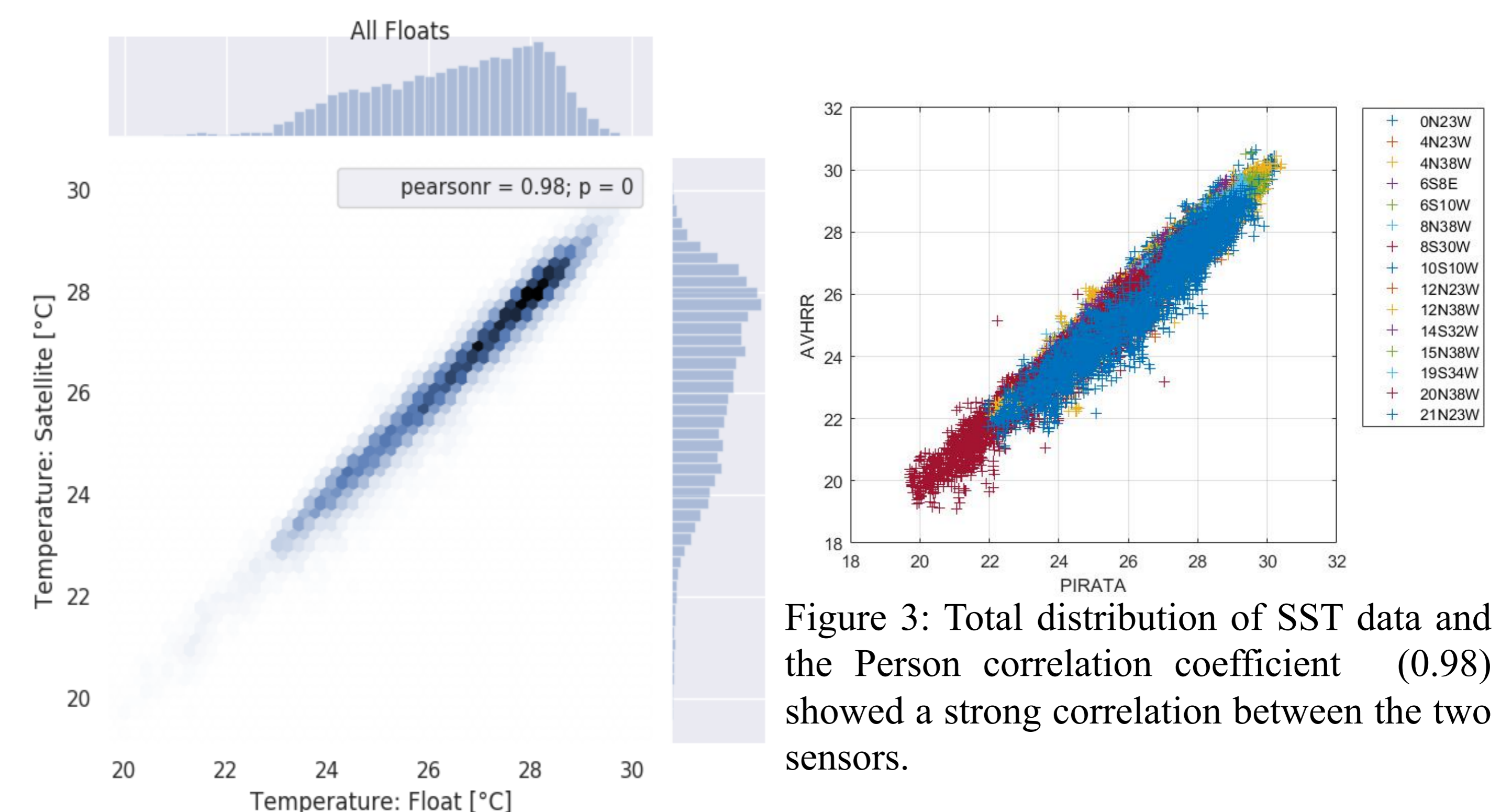


Figure 3: Total distribution of SST data and the Person correlation coefficient (0.98) showed a strong correlation between the two sensors.

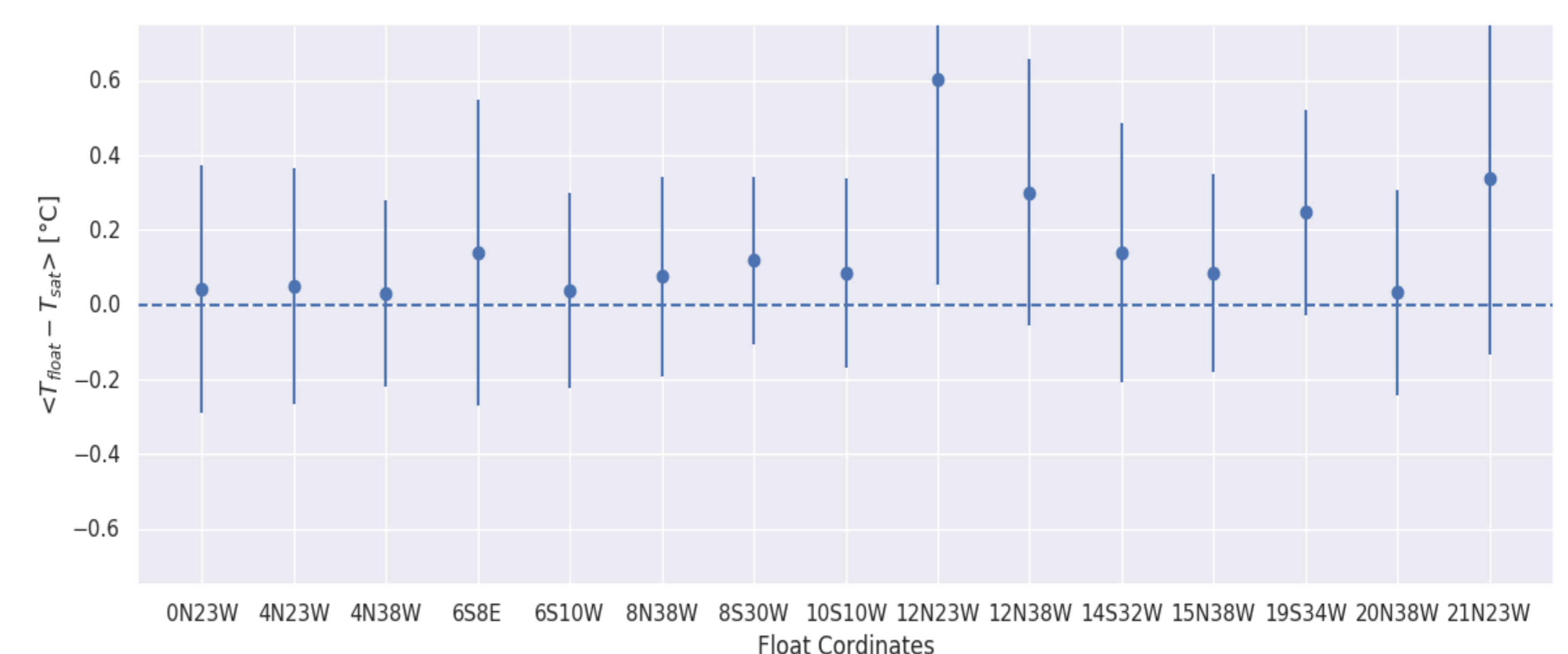


Figure 4: Average of each float with its associated standard deviation. According to the results the spatial sensor has performed measurements of lower temperatures than those found in situ measurements.

### SUMMARY

- SST measurements from the AVHRR-NOAA, extracted to a point in one image of resolution 25-km showed excellent correlation in relation to in situ SST data measurements of the fixed floats of PIRATA program in Equatorial Atlantic Ocean.
- The data time series analysis in ten years (2007-2017) between spatial sensor data and in situ sensor data of SST on Equatorial Atlantic Ocean, in 15 distinct geographic positions in the Atlantic Ocean, showed that the sensor AVHRR on board the NOAA satellite has measured lower SST values than the in situ measures of the PIRATA program.

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