Should Argo resolution be improved in the equatorial oceans?

Observation of the zonal structure and propagation of equatorial intra-seasonal to interannual anomalies are important for understanding and prediction of tropical variability (e.g. ENSO).

Equatorial moorings have poor vertical resolution (e.g. 11 T-sensors from 0-500 m in eastern Pacific, aimed at SST and $Z_{thermocline}$).

Argo cannot react quickly when problems occur in the moored arrays (e.g. 2012); therefore Argo should maintain good resolution in the equatorial waveguide.

Ekman divergence is nearly eliminated in Argo floats with Iridium and short surface times, so floats remain near the equator.

Of 5 eastern Pacific equatorial TAO moorings (95W, 110W, 125W, 140W, 155W), only 140W has returned any data since June 2012, and it is missing 50-100m temperature.
Red: Monthly mean SST anomaly from TAO, 2005-2012 mean removed
Blue: Monthly mean SST anomaly from Argo (SIO grid file, 2005-2012 mean removed)
RMS Diff: 0.89°C; Argo captures 82% of variance

Eq, 95°W, SST

RMS Diff: 0.60°C; Argo captures 90% of variance

Eq, 110°W, SST

RMS Diff: 0.45°C; Argo captures 90% of variance

Eq, 125°W, SST

RMS Diff: 0.28°C; Argo captures 95% of variance

Eq, 140°W, SST

X-Axis: TAO monthly anomaly ; Y-Axis Argo monthly anomaly
Eq, 95°W, 100 m  TAO: 39% of months

Eq, 110°W, 100 m  TAO: 56% of months

Eq, 125°W, 100 m  TAO: 65% of months

Eq, 140°W, 100 m  TAO: 77% of months
RMS Diff: 0.46°C; Argo captures 80% of variance

Eq, 95°W, 100 m

RMS Diff: 0.56°C; Argo captures 87% of variance

Eq, 110°W, 100 m

RMS Diff: 0.90°C; Argo captures 80% of variance

Eq, 125°W, 100 m

RMS Diff: 0.86°C; Argo captures 88% of variance

Eq, 140°W, 100 m
At present there are 45 active floats between 1.5S – 1.5N, 130E - 280E (90% of Argo design)

Proposal: Increase the number of floats to 100 (2 x Argo). Use long-life (300 cycle) floats and decrease the cycle time to 7 days. (5200 cycles per year instead of 1825 cycles per year). This should be coordinated with the equatorial mooring programs (e.g. via JCOMMOPS Observations Coordination Group.)

Same in the Indian Ocean?

Argo 2010 profiles 10S to 10N