Physical Oceanography Questions

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A snapshot of sea surface height anomalies from T/P and ERS altimeters
Spatial scales of the AVISO T/P-ERS merged data

Correlation of SSH time series as function of spatial separation

A spatial scale computed as follows:

\[
\frac{[\phi(\mathbf{r})]^2}{[\phi(0)]^2}
\]

\[L = 210 \text{ km}\]

Scales shorter than 150-200 km are not resolved.

SSH wavenumber spectra (Ducet et al. 2000)
Coastal currents have scales less than 10 km.

Observations made by ADCP offshore from the US West Coast.

\( \delta h \sim 5 \text{ cm} \)
\( \delta v \sim 50 \text{ cm/sec} \)

T. Strub, 2006
Much reduced noise floor will enable the study of the spectrum at sub-mesoscales which have not been well resolved from existing data.
Internal Tides & Topex/Poseidon

- Besides the intrinsic science of internal tides, they introduce 2-5 cm/sec error in ocean current velocity.

- Only a non-sun-synchronous orbit can properly sample and remove the errors.
For the three cases, velocity error is reduced from 7.8 to 3.6, 1.3 cm/sec at 25 km resolution.
Oceanic Processes Resolved by Various Missions

- **TOPEX/Poseidon**
- **Hydrosphere Mapper**
- **Jason, or OSTM**