

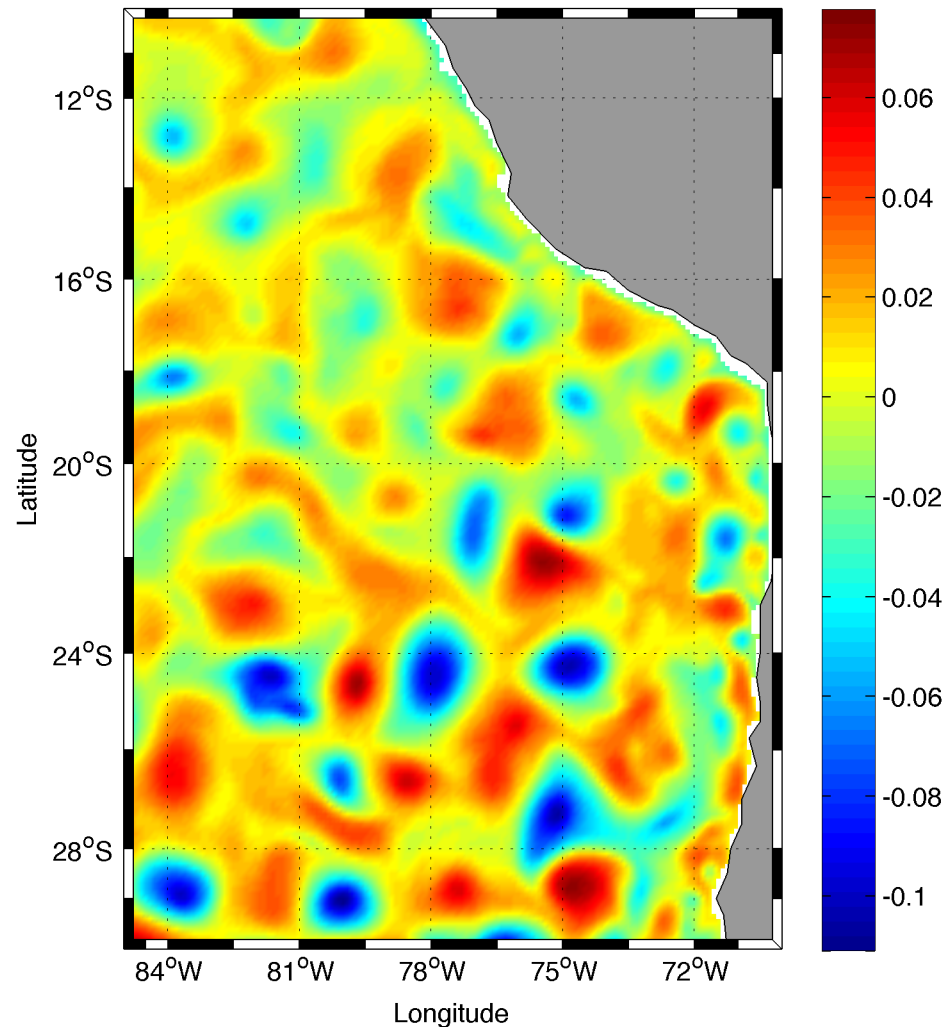


Detection of subsurface eddies from satellite observations

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Sea level anomaly (m)



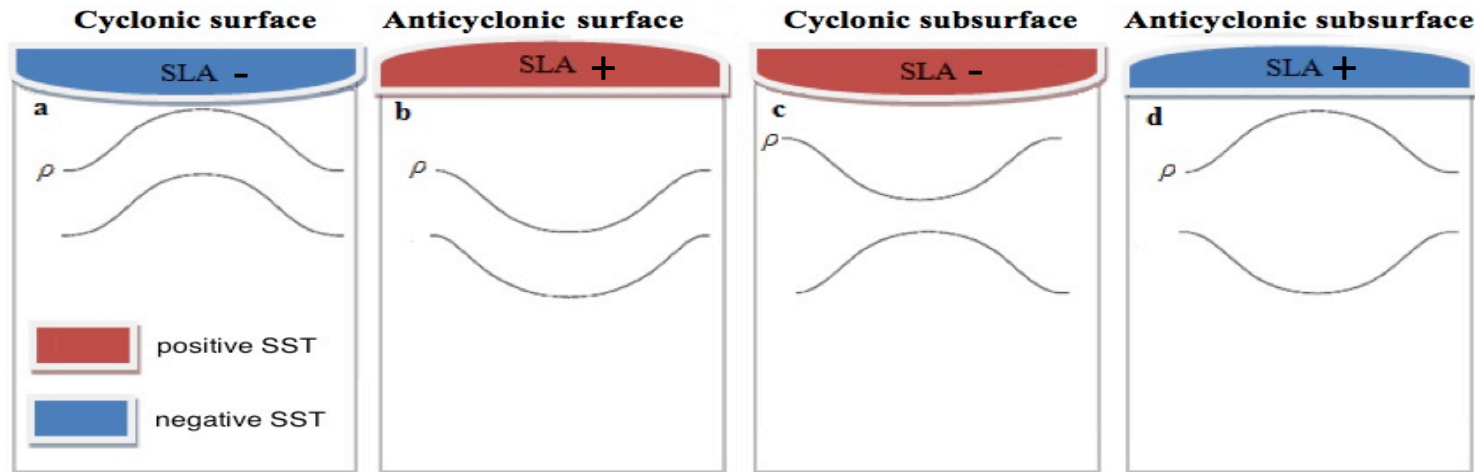
Stammer *et al.* (1991)
Caballero *et al.* (2008)



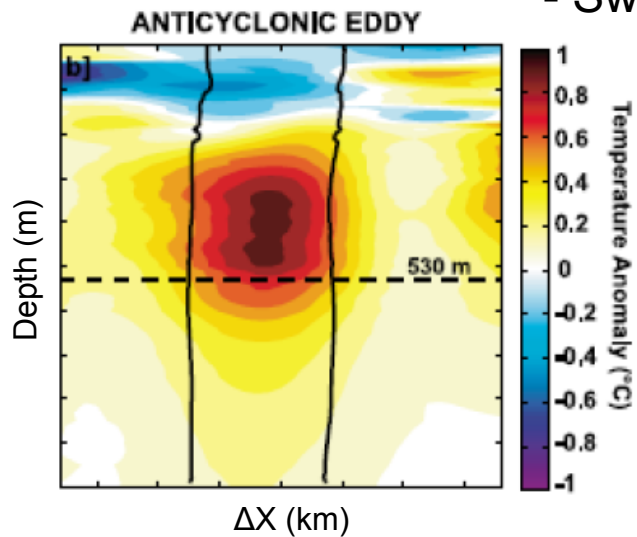
Meddy
Swoddy

Aim of the study

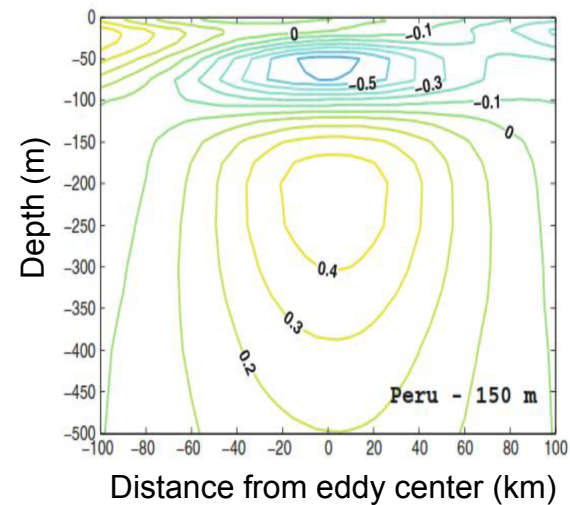
**To develop an index to distinguish
surface and subsurface intensified
eddies**



- McGillicuddy *et al.* (1999)
- Sweeney *et al.* (2003)

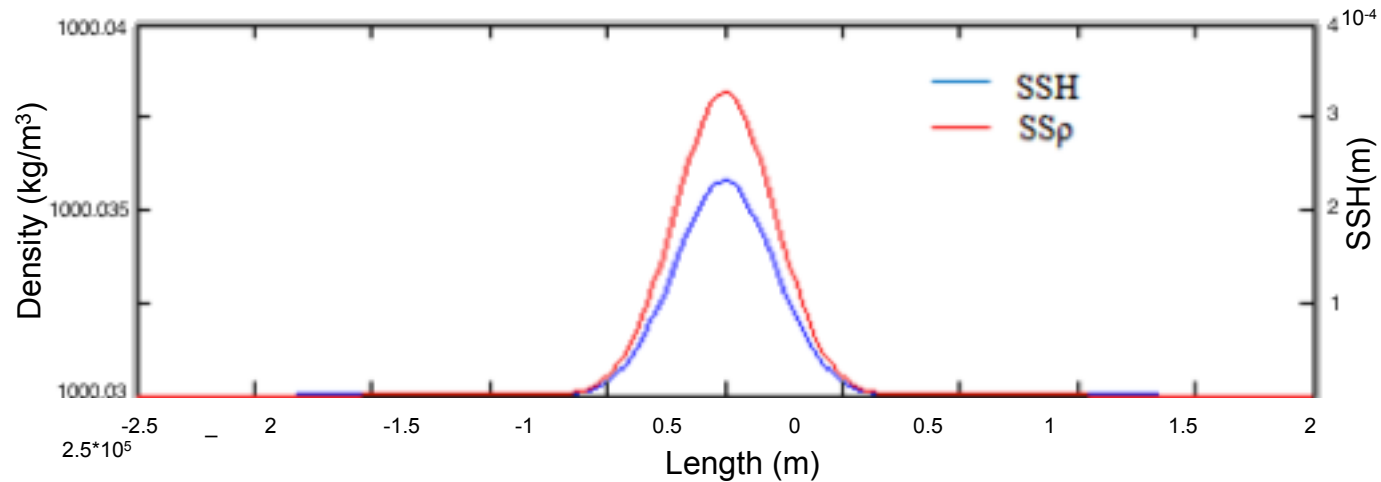


- Chaigneau *et al.* (2011)

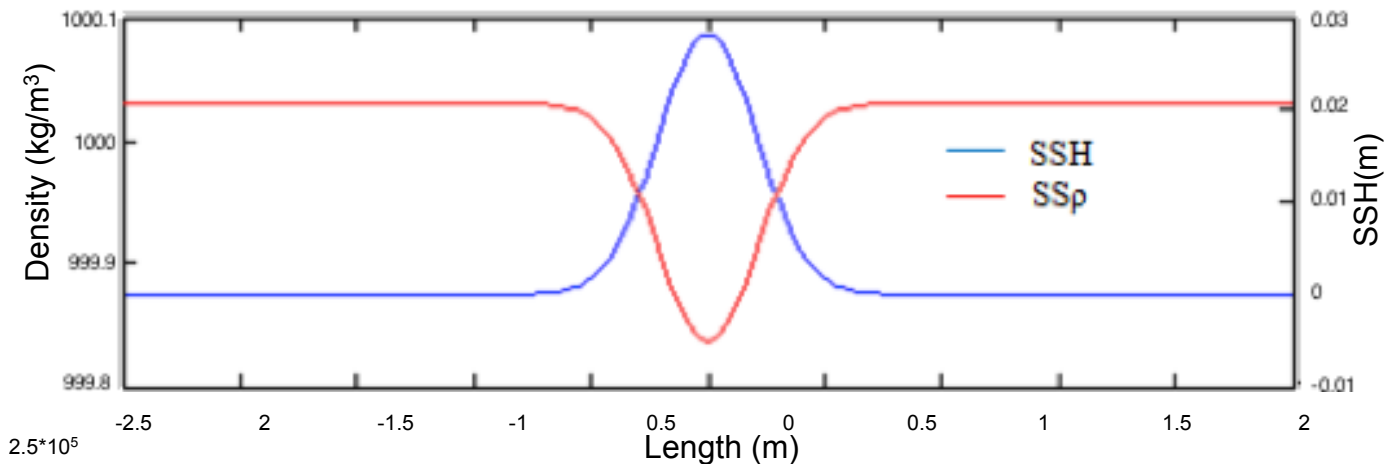


- Colas *et al.* (2011)

Anticyclonic eddy intensified in subsurface



Anticyclonic eddy intensified in surface

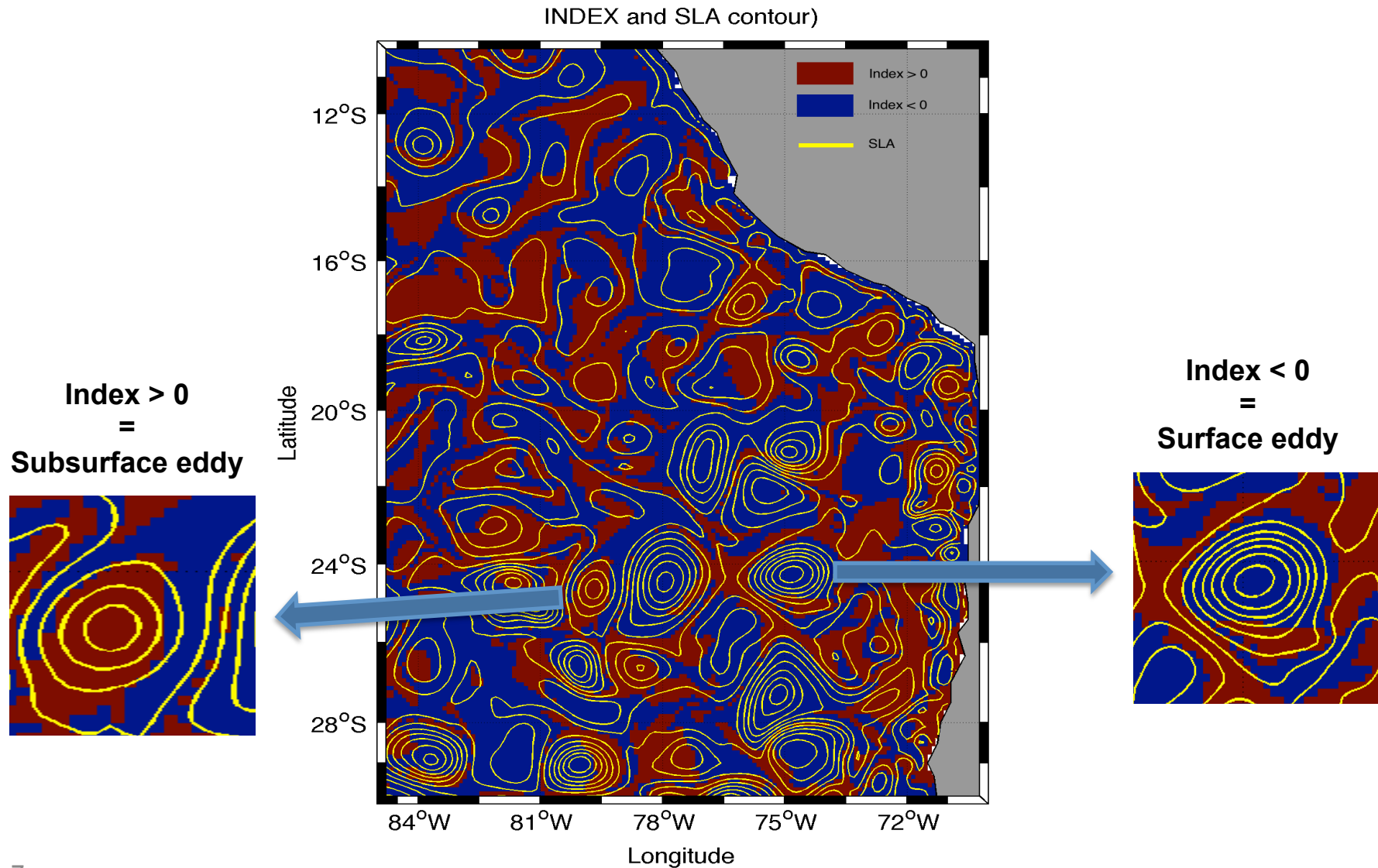


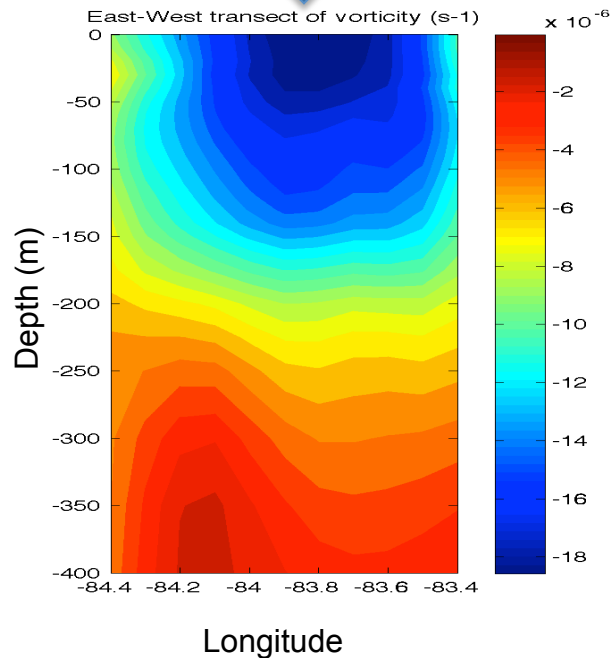
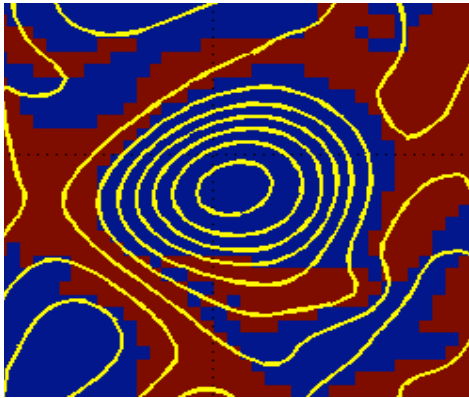
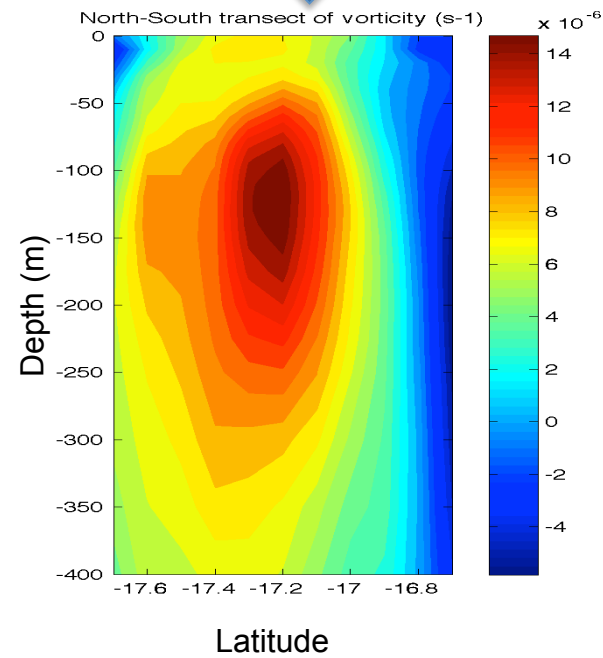
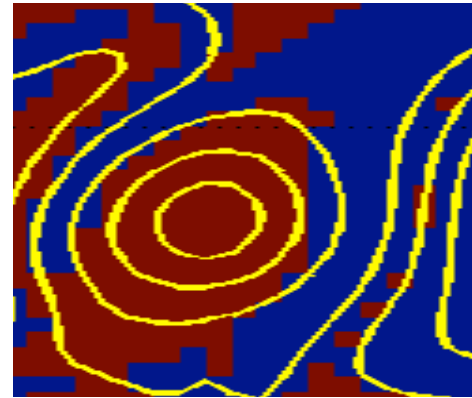
$$Index = \frac{SS\rho A}{SLA}$$

$$\frac{SS\rho A}{SLA} > 0 \rightarrow \textit{Subsurface eddy}$$

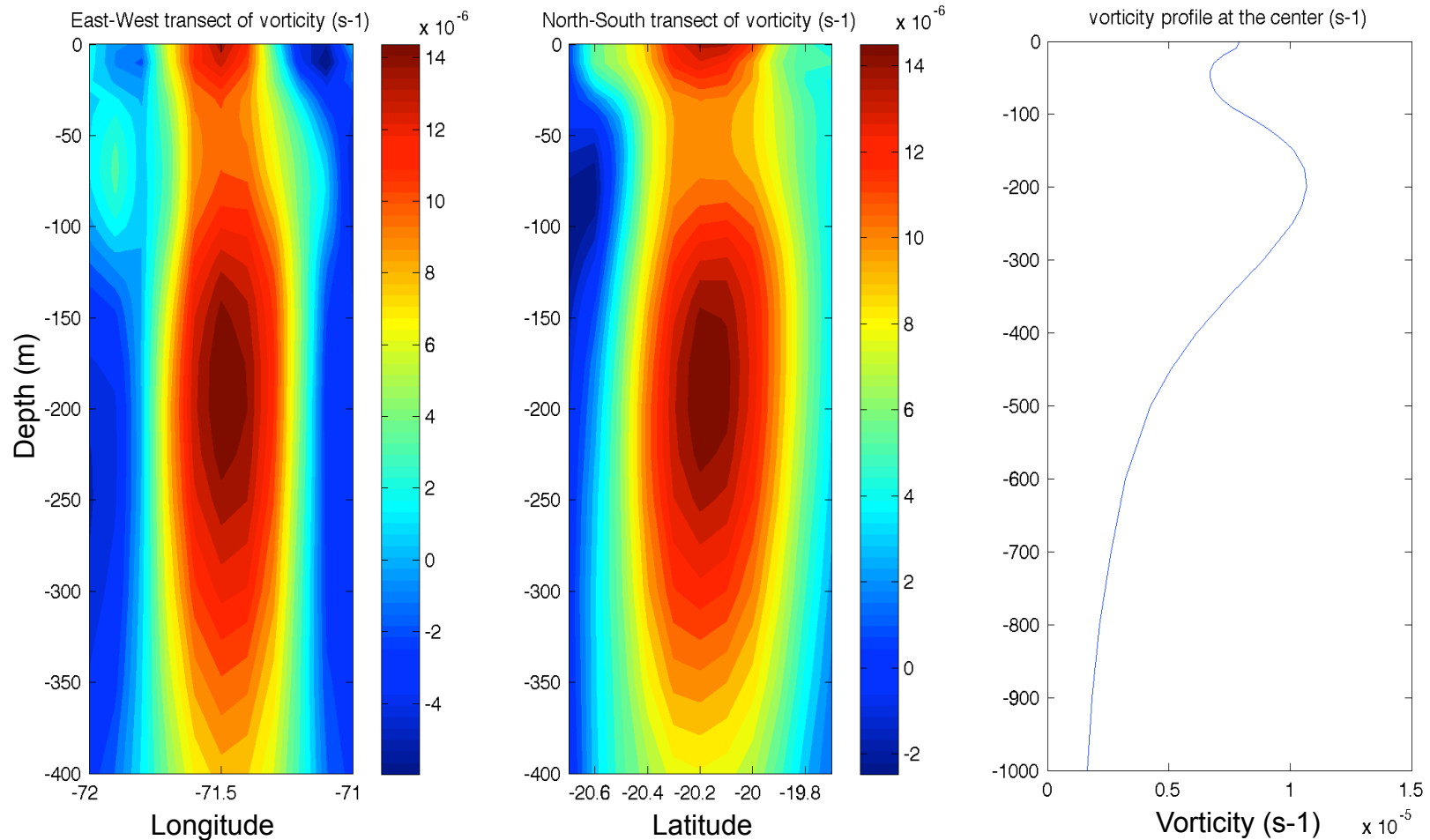
$$\frac{SS\rho A}{SLA} < 0 \rightarrow \textit{surface eddy}$$

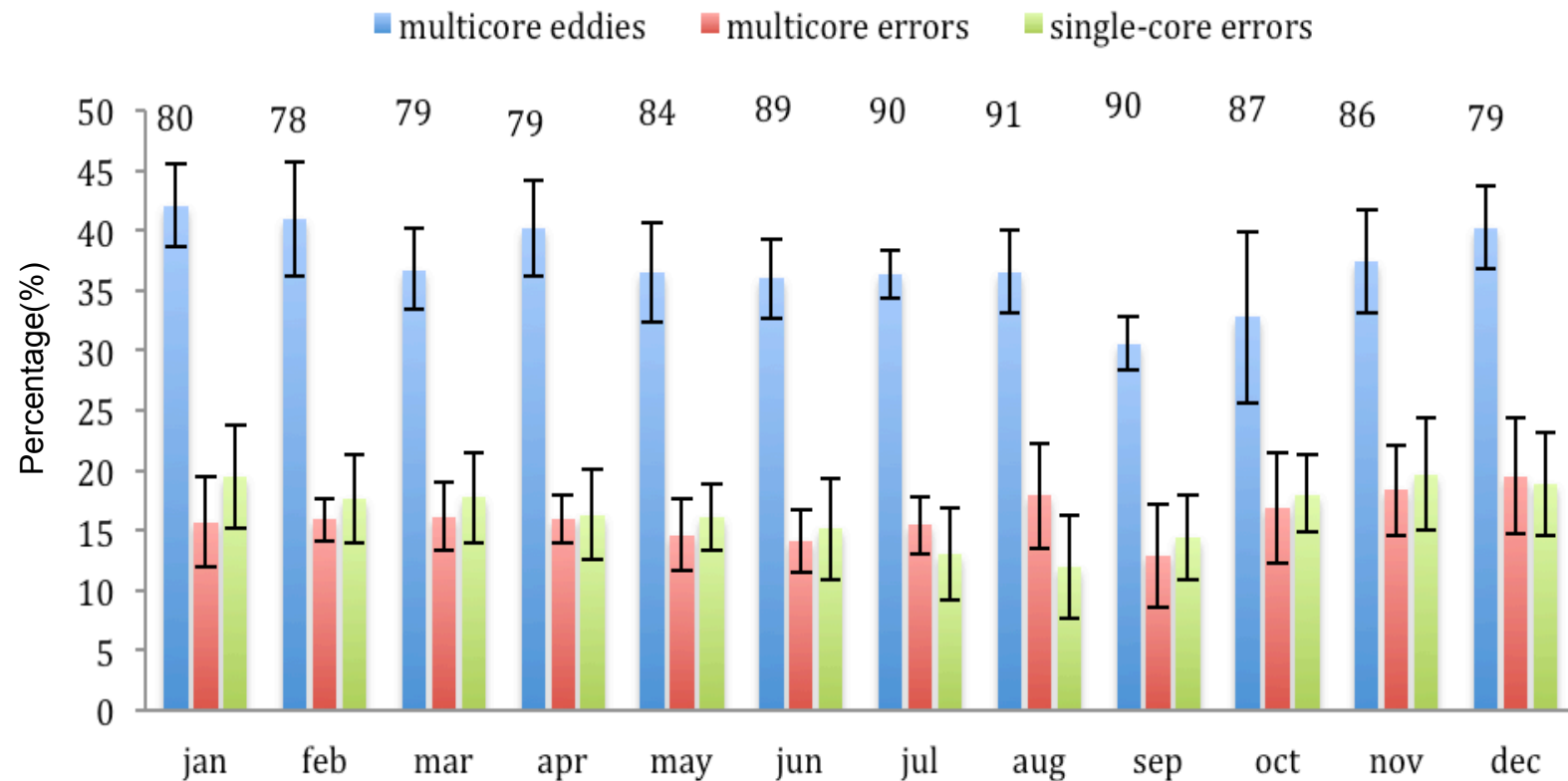
Index SSpA /SLA



Surface cyclonic eddy**Subsurface anticyclonic eddy**

Multicore eddy

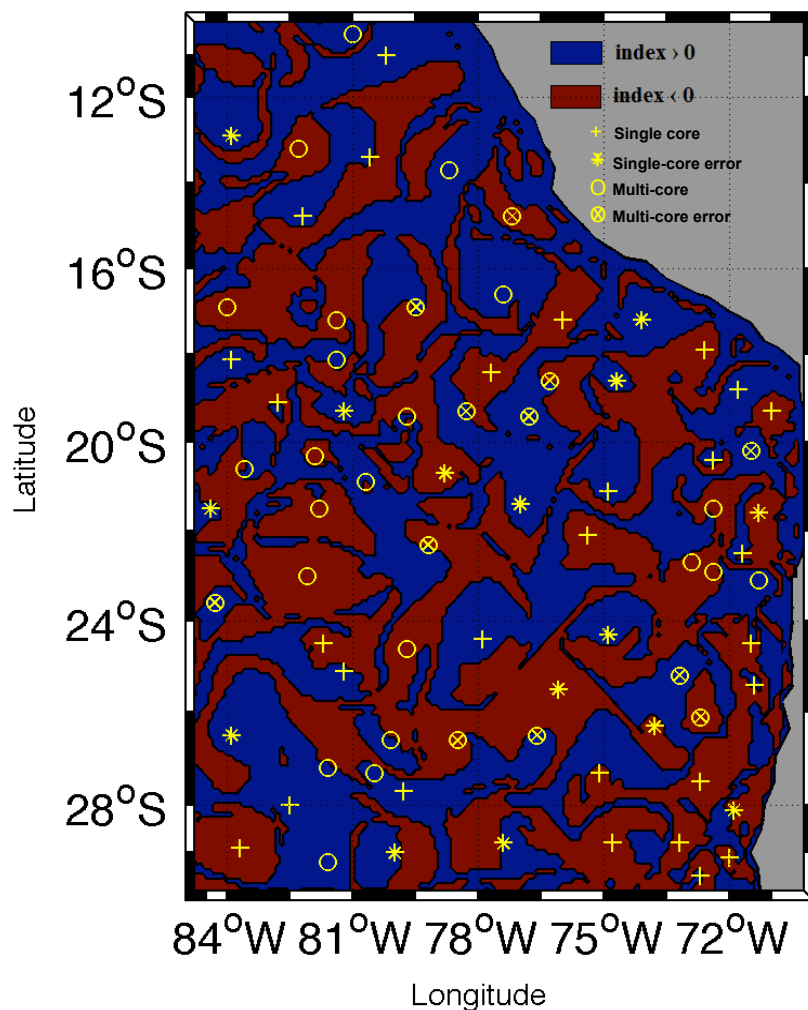




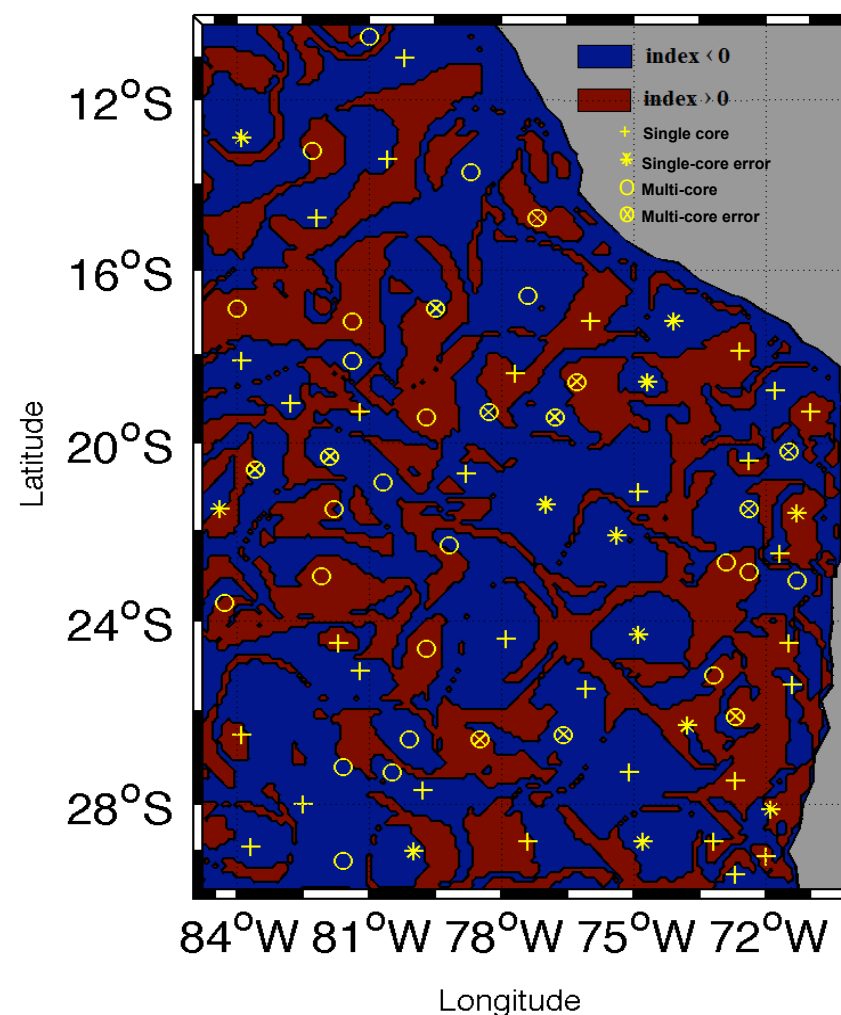
Statistics of eddies identification (mean of 7 years)

Index SSTA vs SLA

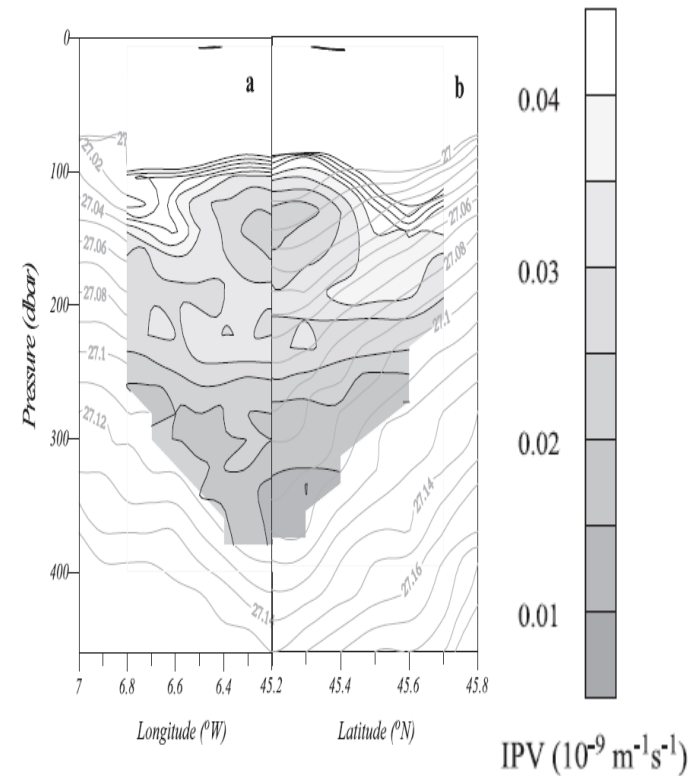
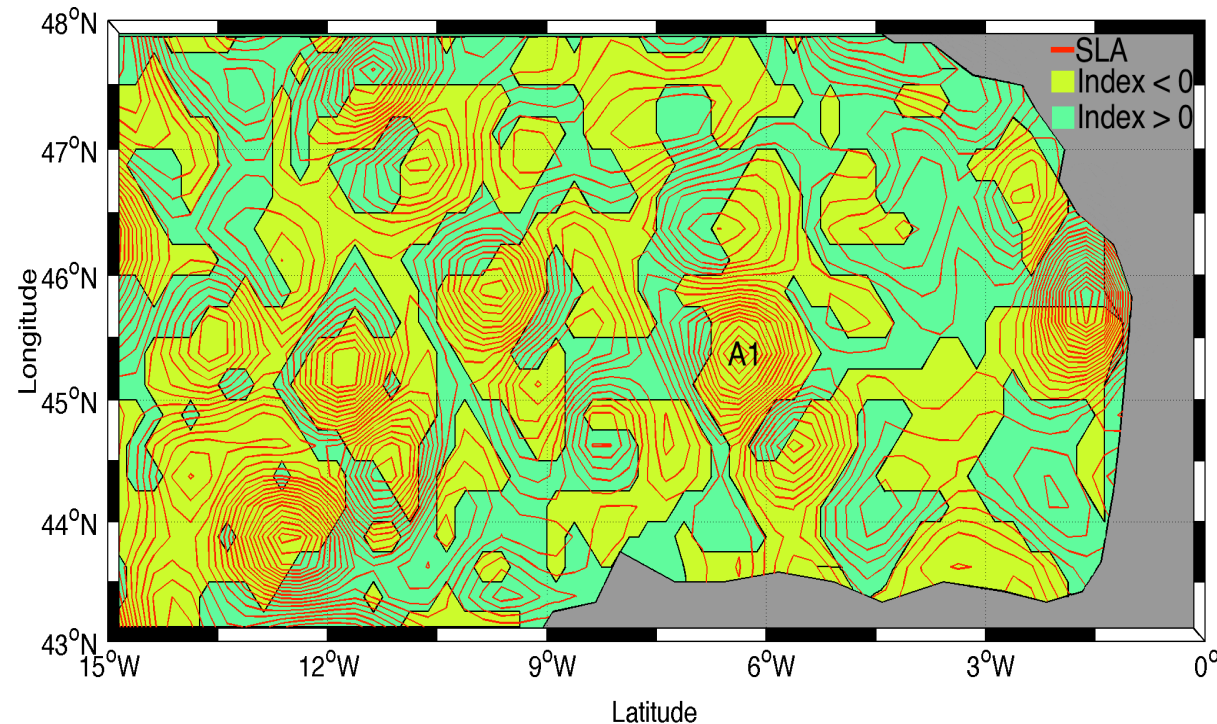
Density



Temperature



Index SSTA/SLA in the Bay of Biscay 08 August 1998



vertical section of potential
vorticity Sánchez & Gil 2004

- Good rate of right detection (70%) in the Peru-Chile area with the regional model (ROMS).
- Multi-core structure cannot be detected by the proposed index.
- Validation by a real satellite observations in the Bay of Biscay.

Surface anomalies, measured from satellite, can be used to determine the nature (surface or subsurface) of eddies.

Thank you for your attention

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