Knowledge on eddies in coastal waters ... still a lot of open questions

How are eddies generated?

How do they influence coastal-offshore transports of matter and heat?

How do they influence biogeochemistry?

LATEX project in the Gulf of Lion

In situ data
September 2008

[Hu et al, 2010] and [Hu et al, 2011]
Two quantitative criteria on wind forcing & stratification

\[ \phi = \frac{1}{D} \int_{-H}^{H} g z (\bar{\rho} - \rho) dz \]

Potential energy anomaly

explain the presence or absence of coastal mesoscale anticyclonic eddies from 2001 to 2008

Numerical results confirmed by in situ data during specific years

[Petrenko et al., EGU 2011 OS2.1]

Mechanism of generation

Winter  Spring  Summer  Fall  Winter

Absence  Transient  Long-life  Transient  Absence

[Hu et al., 2011]