

# CICESE's Moorings

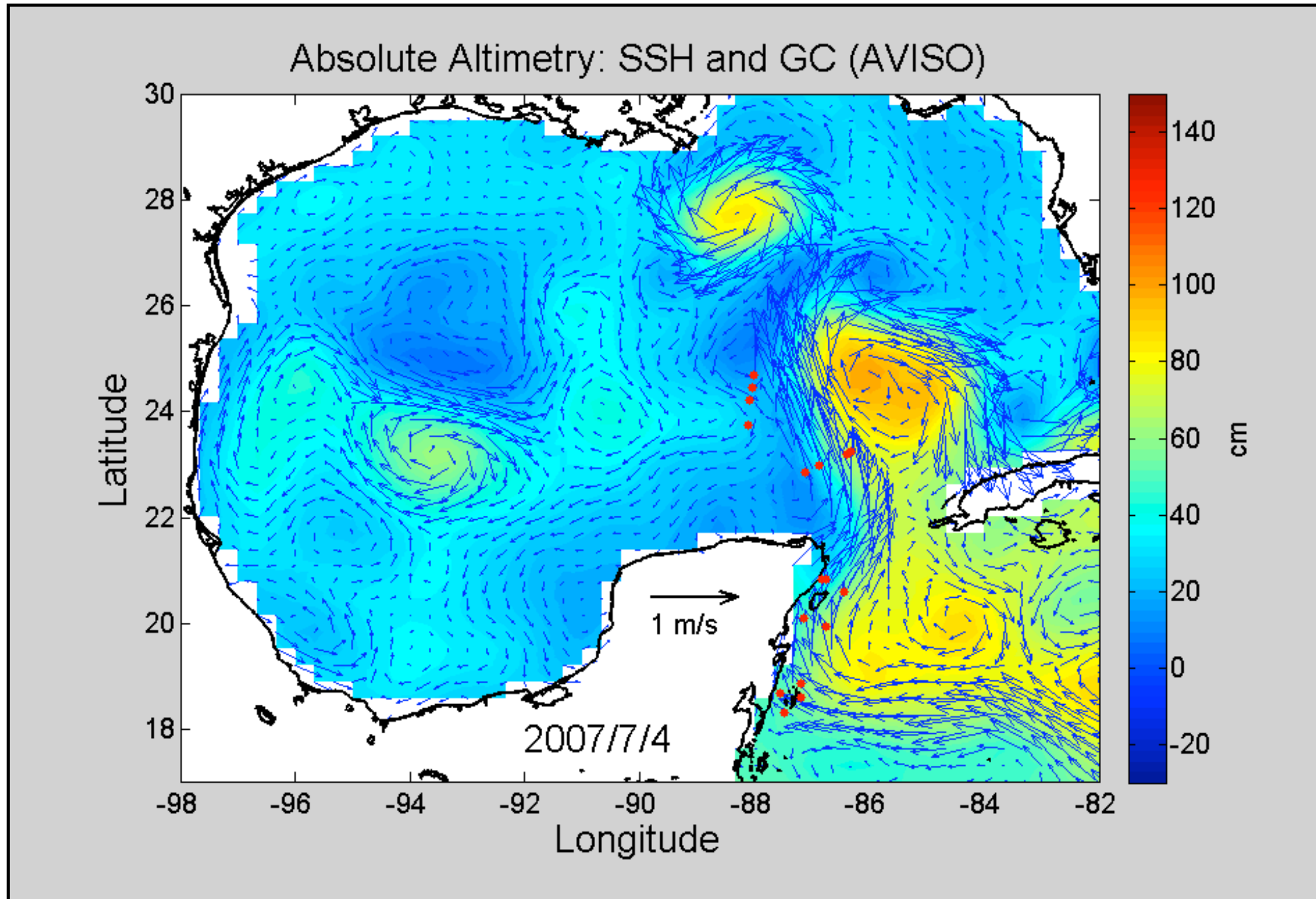
Pallàs-Sanz, E., J. Acevedo, J. Candela, J. Ochoa, J. Sheinbaum, P. Brunius, M. López, M. Tenreiro, and N. Kolodziejczyk

Thanks to CICESE's marine technicians and R/V Justo Sierra's crew.



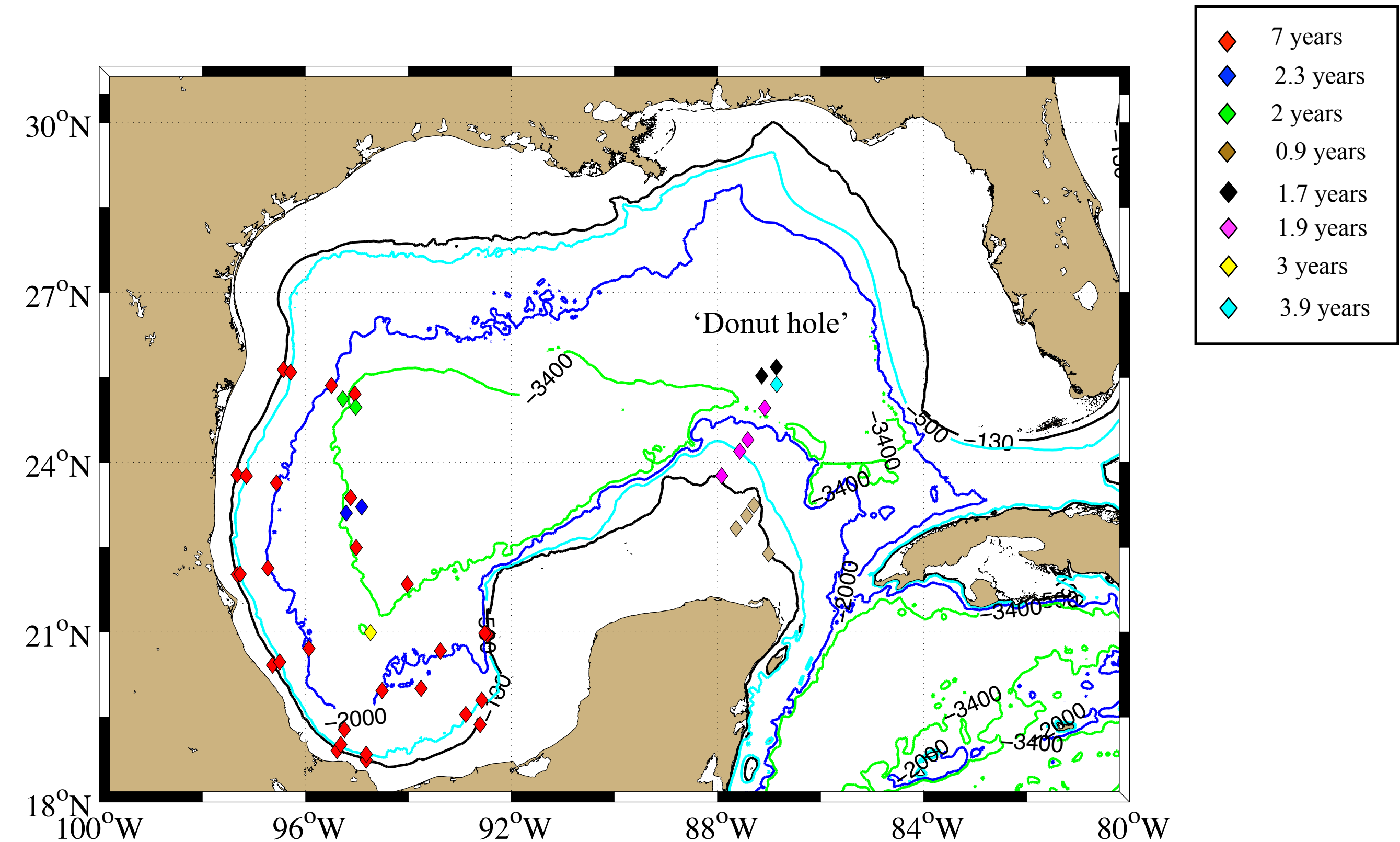
## CANEK moorings

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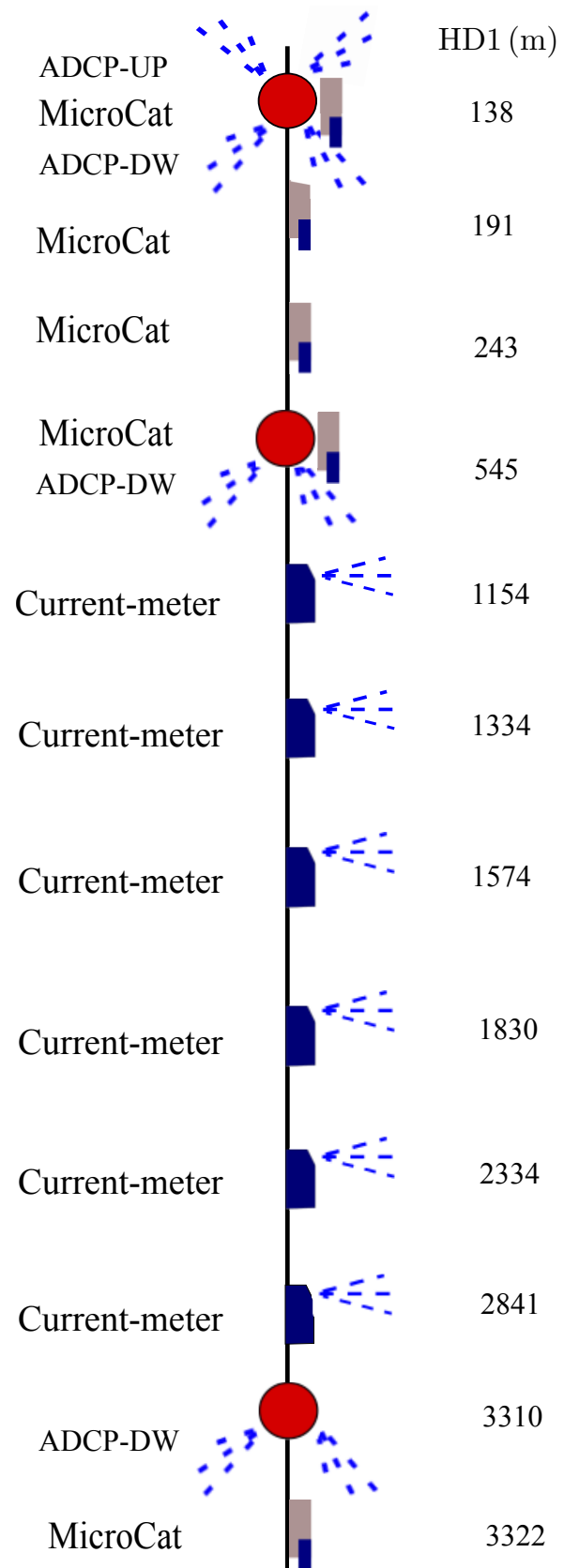
(From Dr. J. Candela)

# Mooring locations





# Mooring sketch and instrumentation



Teledyne RDI WorkHorse 300kHz (8m)



SBE37



Teledyne RDI LongRanger 75kHz (16m)



Aandera RCM11



Nortek Auqadop



Teledyne RDI WorkHorse 600kHz (0.5m)

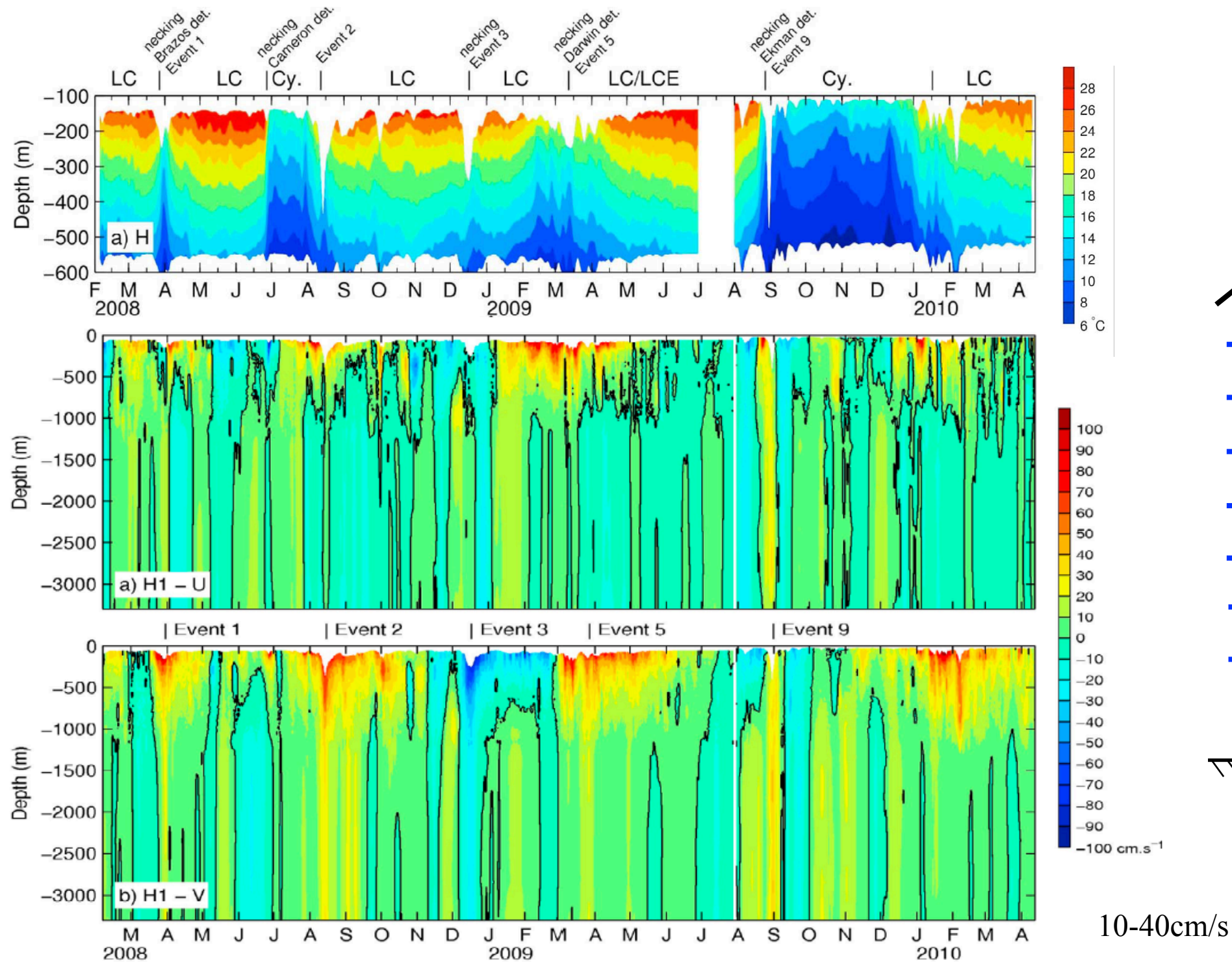




## Connexion between upper and deep layer circulation

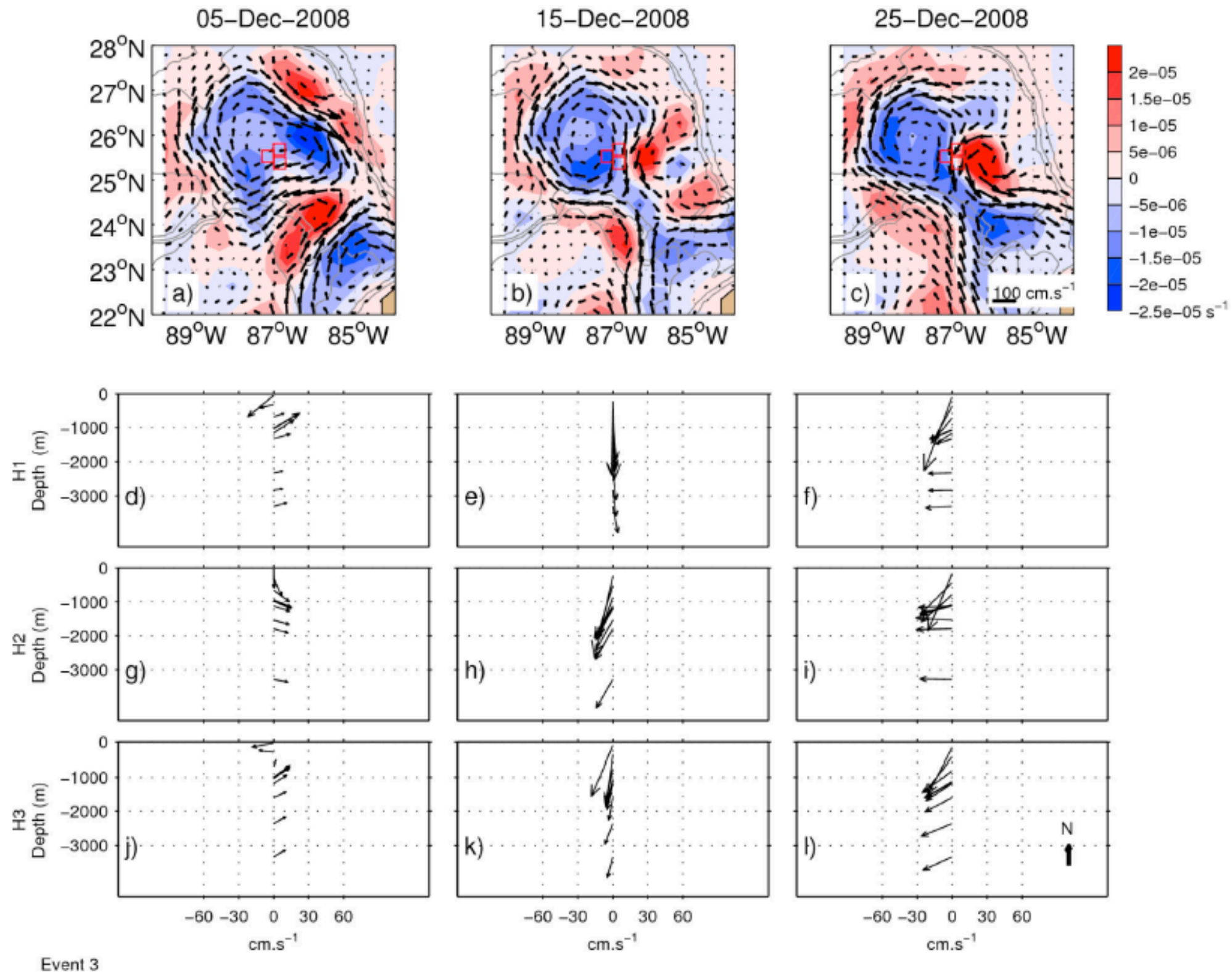
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# Events of coupling at the “Donut hole” (HD)



Kolodziejczyk, N., J. Ochoa, J. Candela, and J. Sheinbaum, 2012: Observations of intermittent deep currents and eddies in the Gulf of Mexico. *J. Geophys. Res.*, **117**, doi:10.1029/2012JC007890.

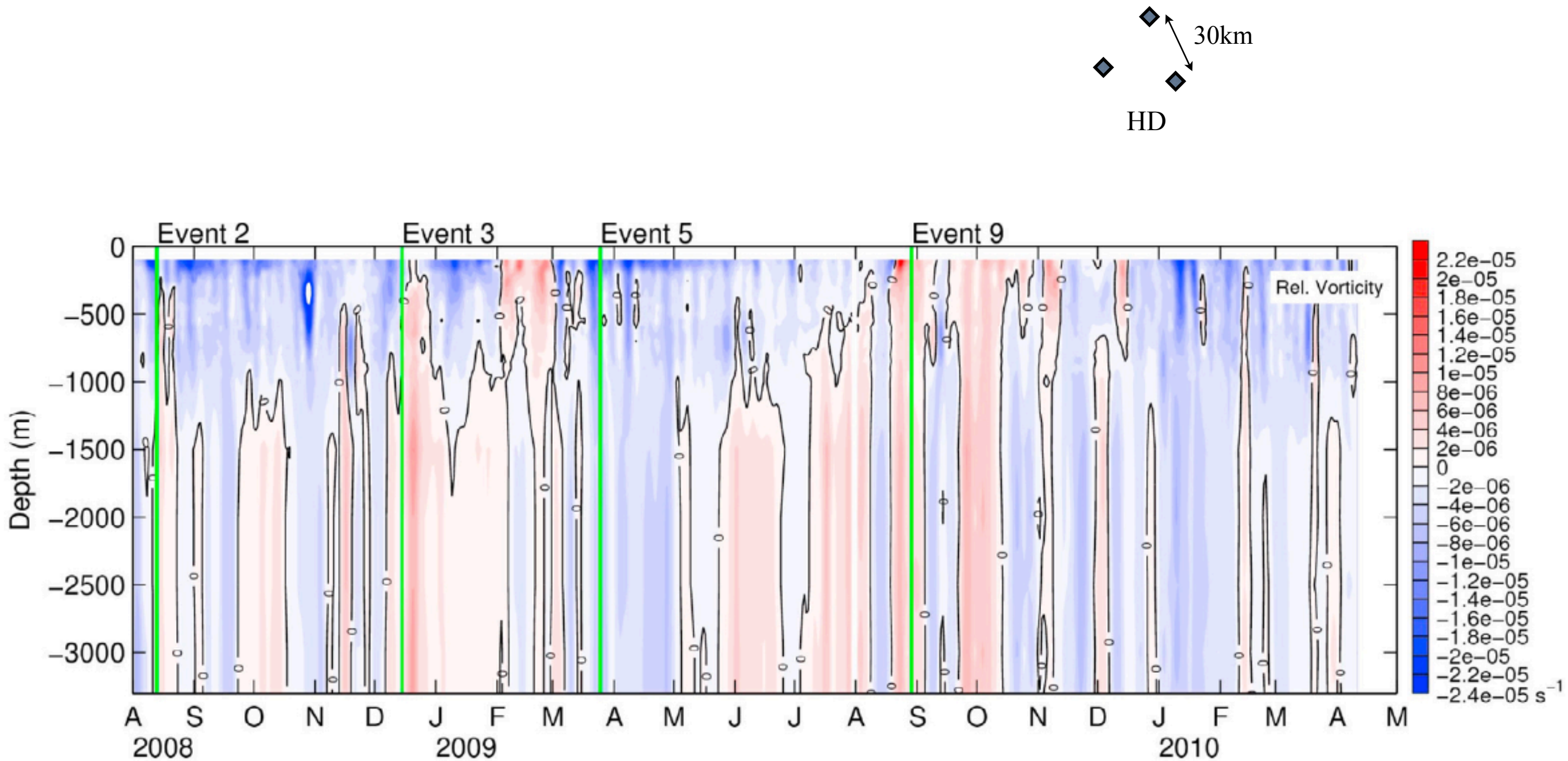
# A case study: Event 3



Kolodziejczyk, N., J. Ochoa, J. Candela, and J. Sheinbaum, 2012: Observations of intermittent deep currents and eddies in the Gulf of Mexico. *J. Geophys. Res.*, **117**, doi:10.1029/2012JC007890.

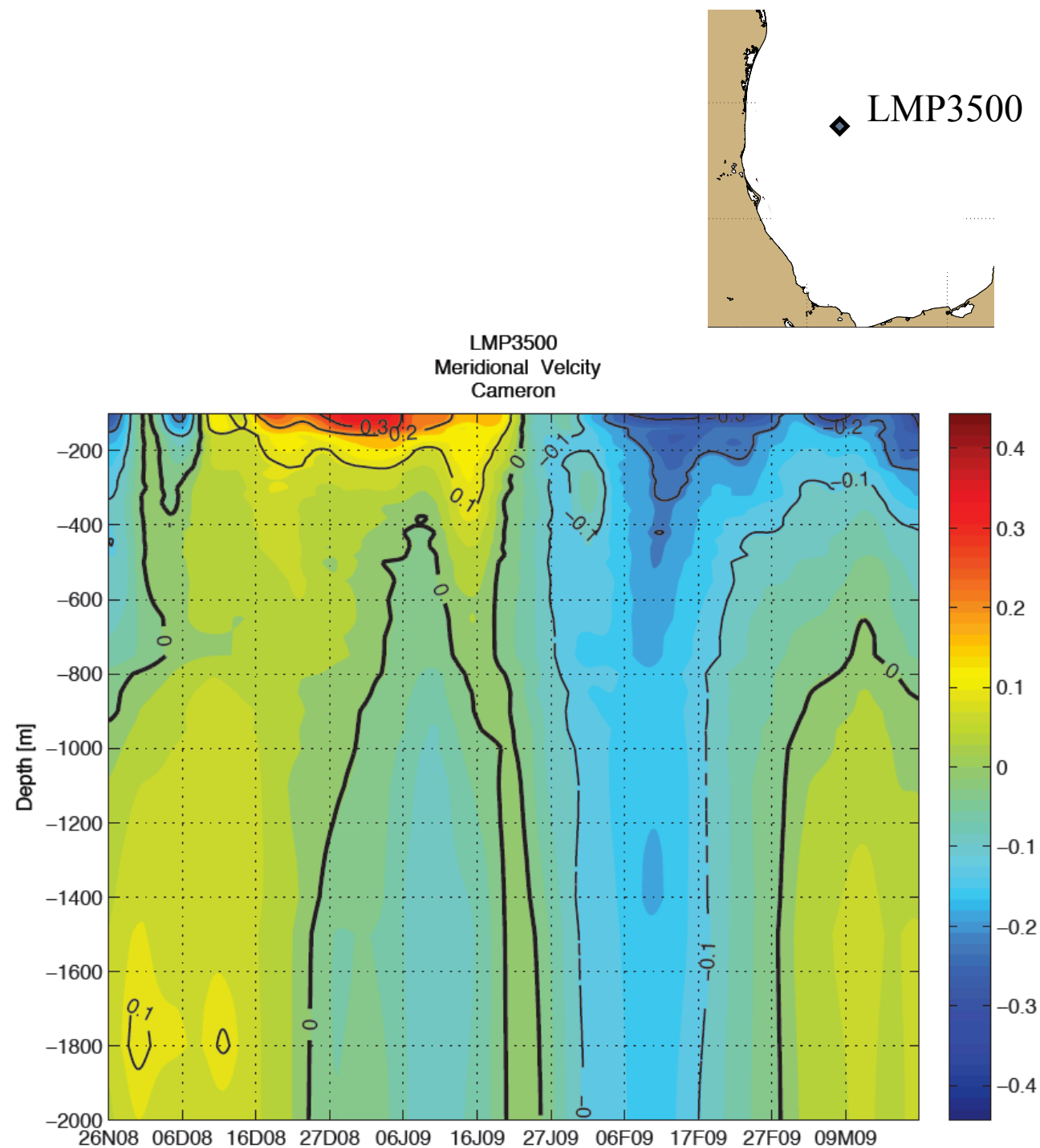


# Vertical vorticity at the HD mooring array

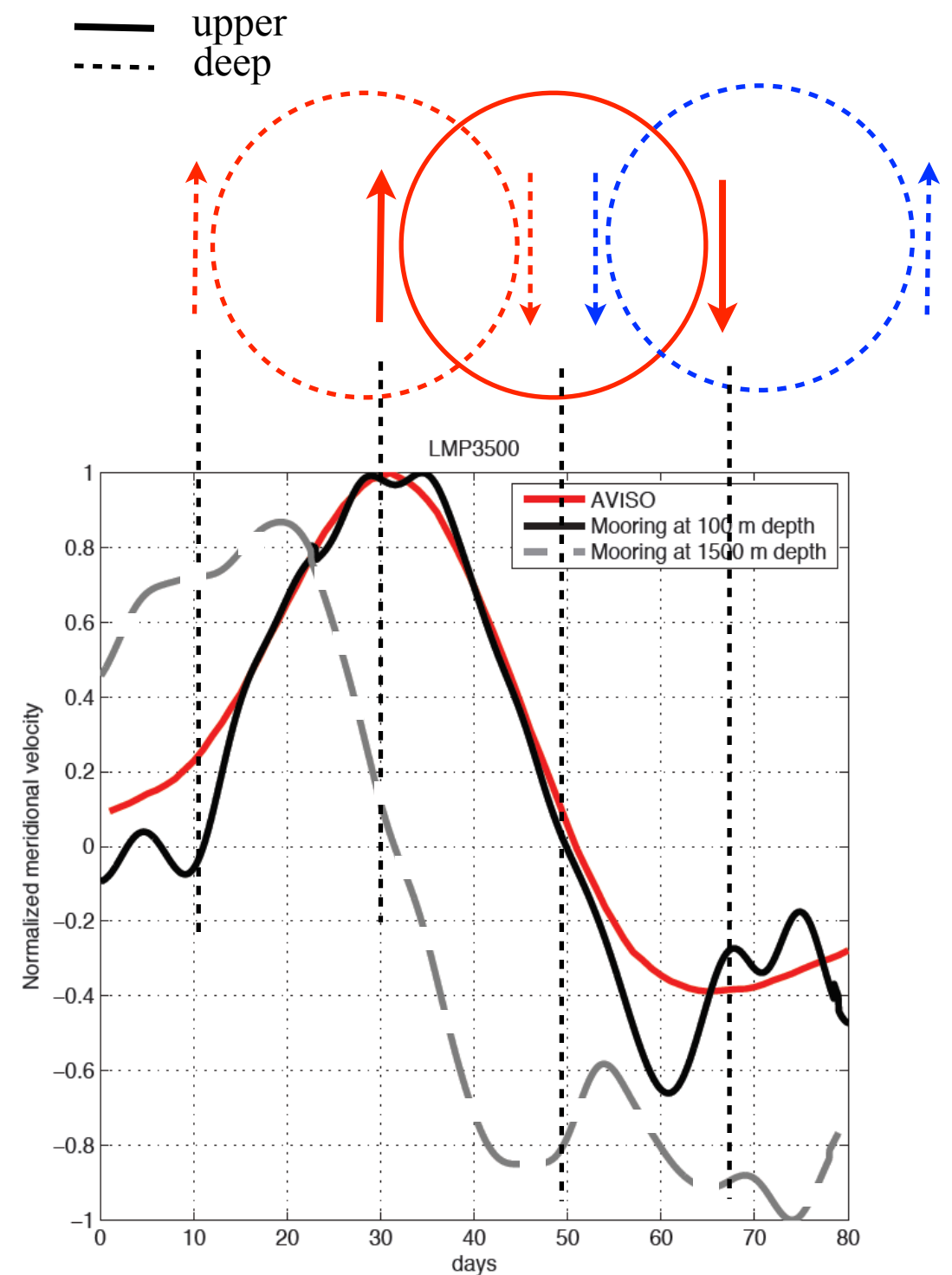


Kolodziejczyk, N., J. Ochoa, J. Candela, and J. Sheinbaum, 2012: Observations of intermittent deep currents and eddies in the Gulf of Mexico. *J. Geophys. Res.*, **117**, doi:10.1029/2012JC007890.

# Decoupling between upper and deep layer circulation



**Fig.** Meridional velocity at LMP3500 during the passage of LCE Cameron.



**Fig.** Averaged meridional velocity for the passage of 9 LCEs

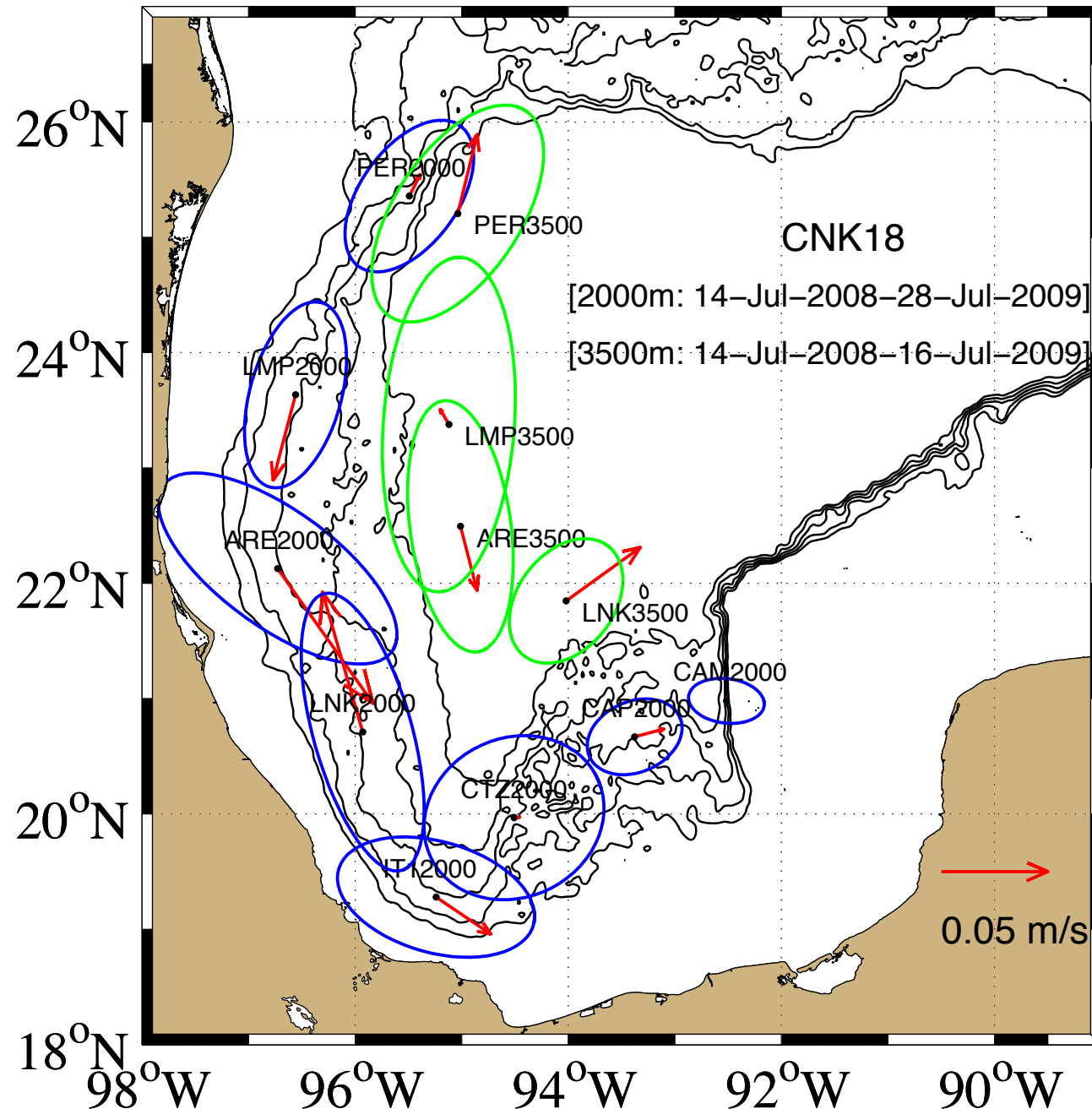


# Deep circulation on the western Gulf of Mexico

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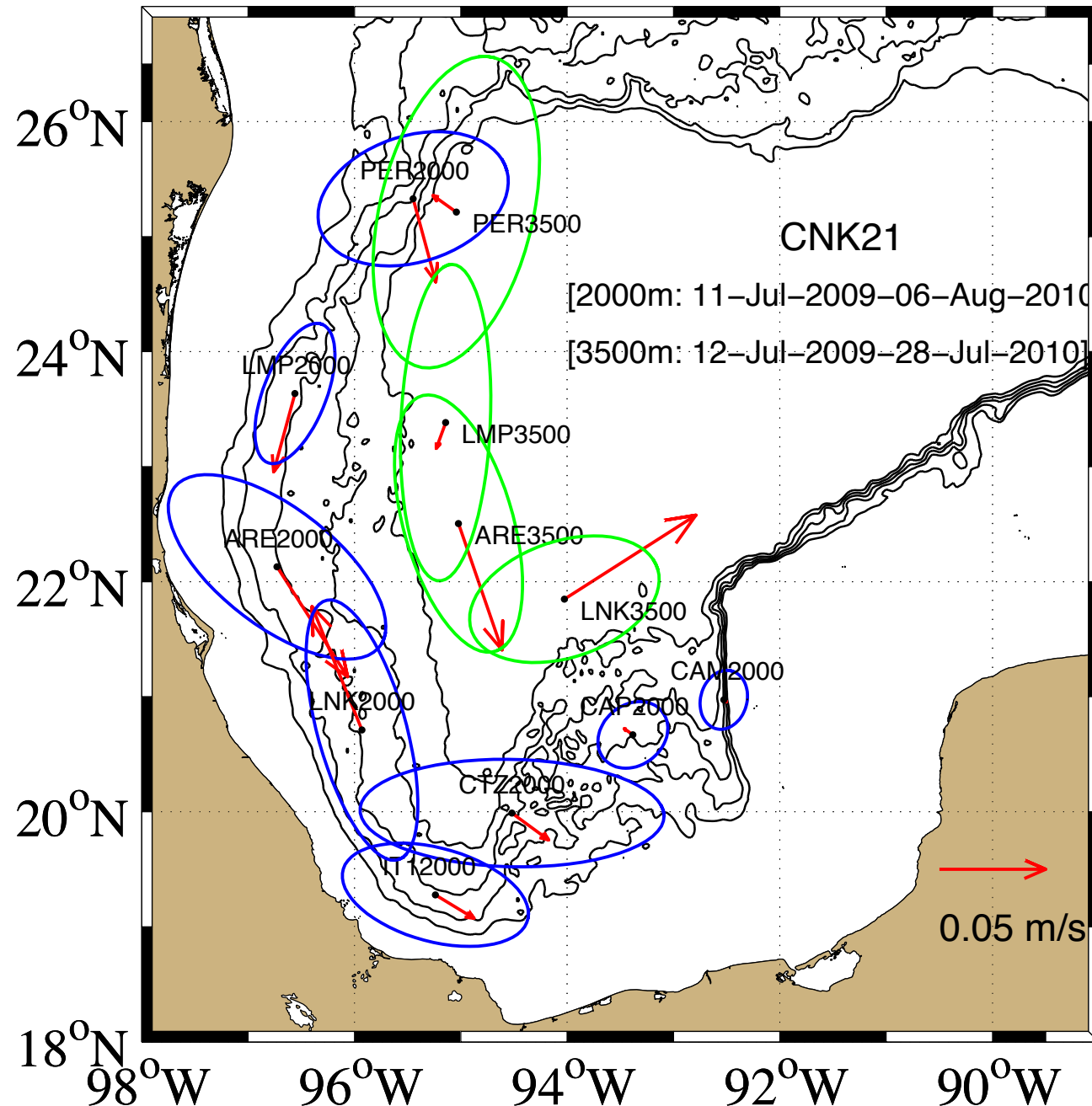


$$Z = u + iv$$



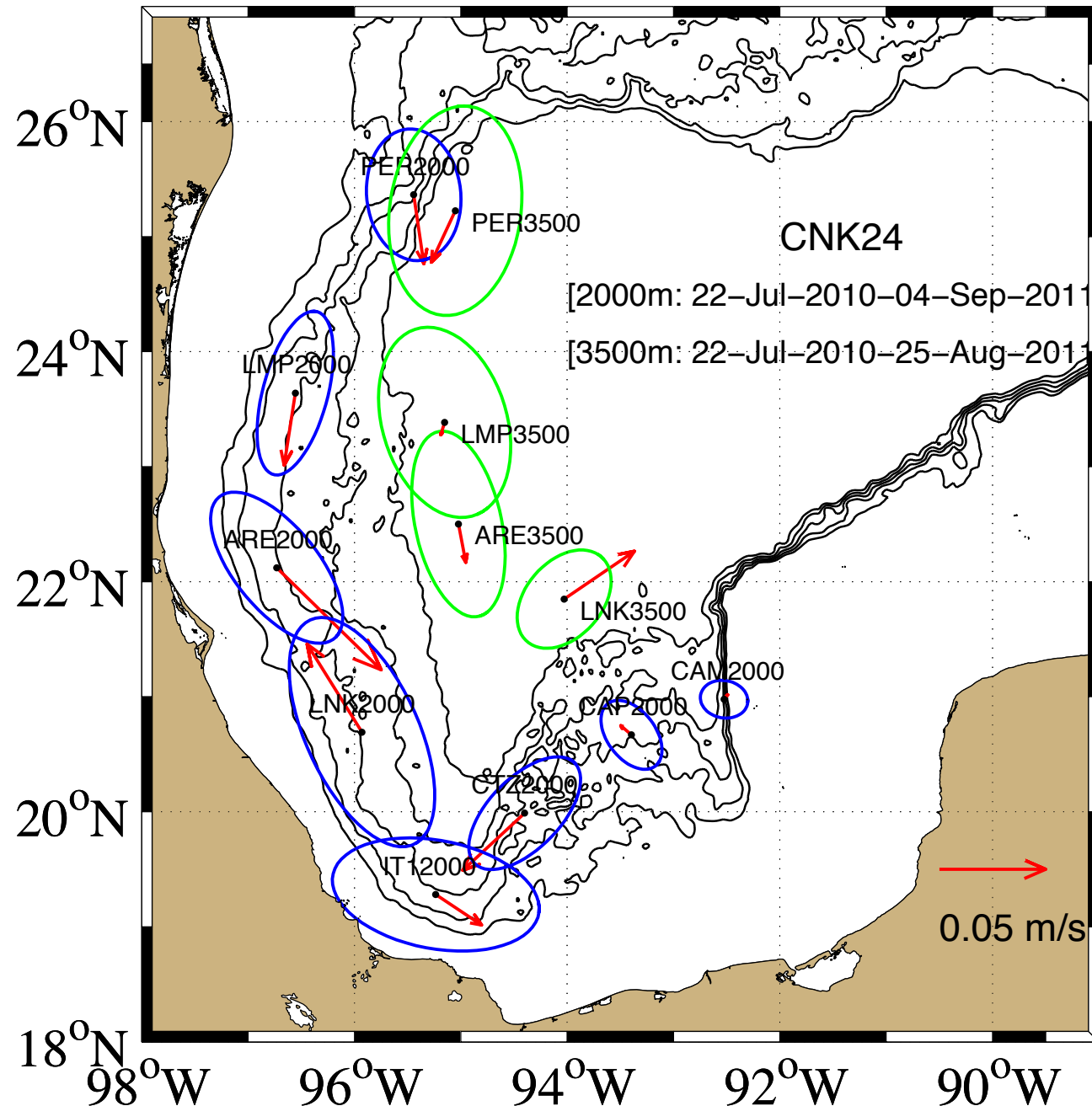
- cyclonic circulation at isobaths of 2000m and 3400m depth (variance ellipses aligned with bathymetry).
- convergent flow between ARE2000 and LNK2000.
- large variability over irregular topography (CTZ2000, CAP2000, and CAM2000).

$$Z = u + iv$$



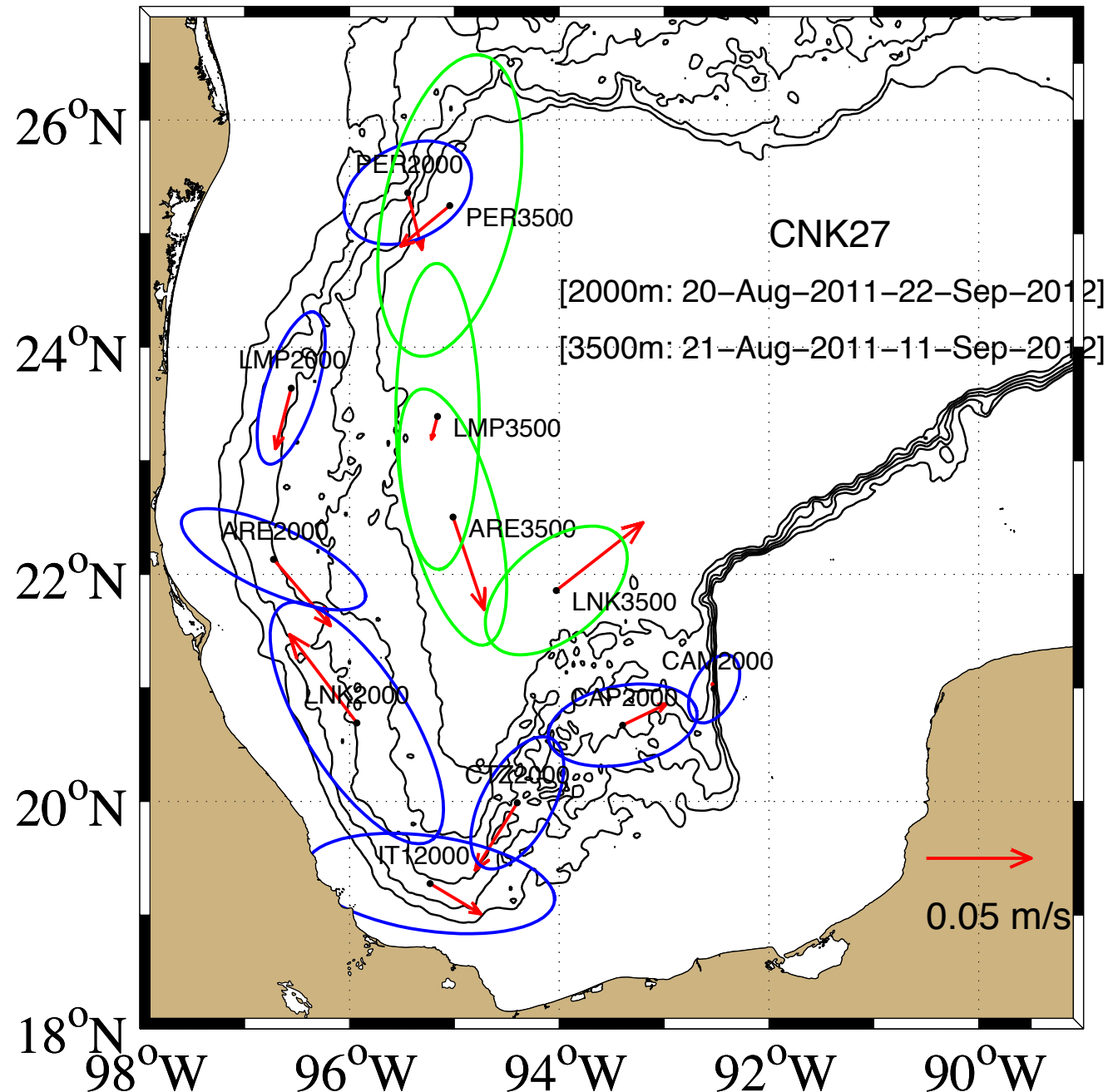
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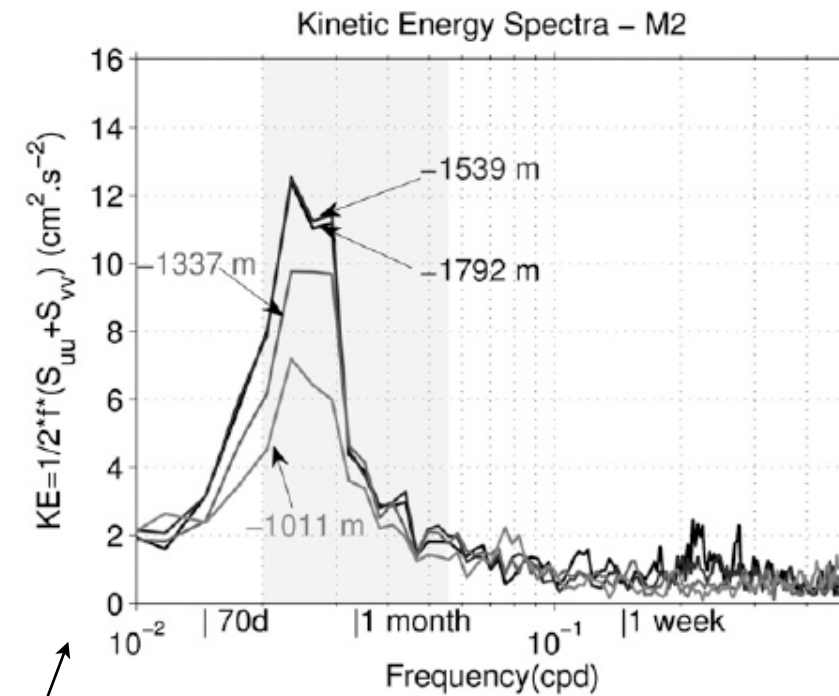
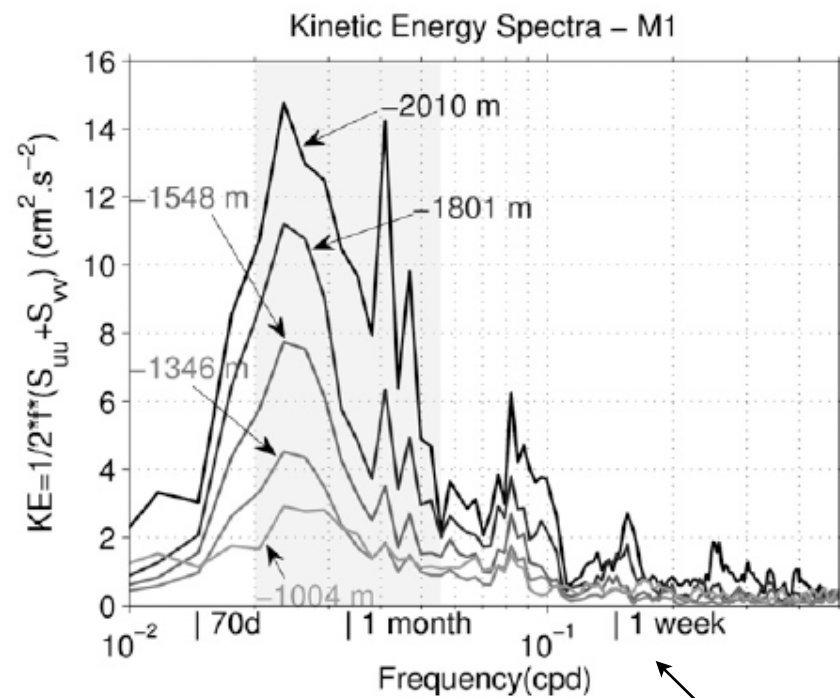
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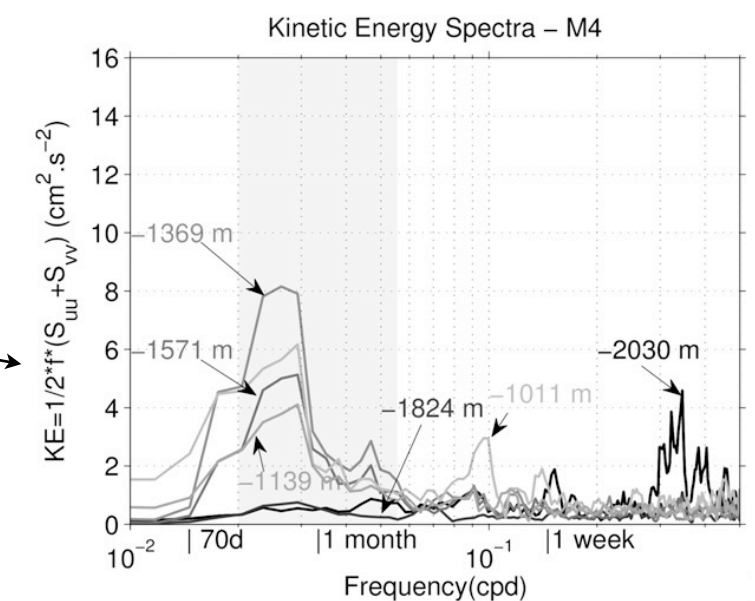
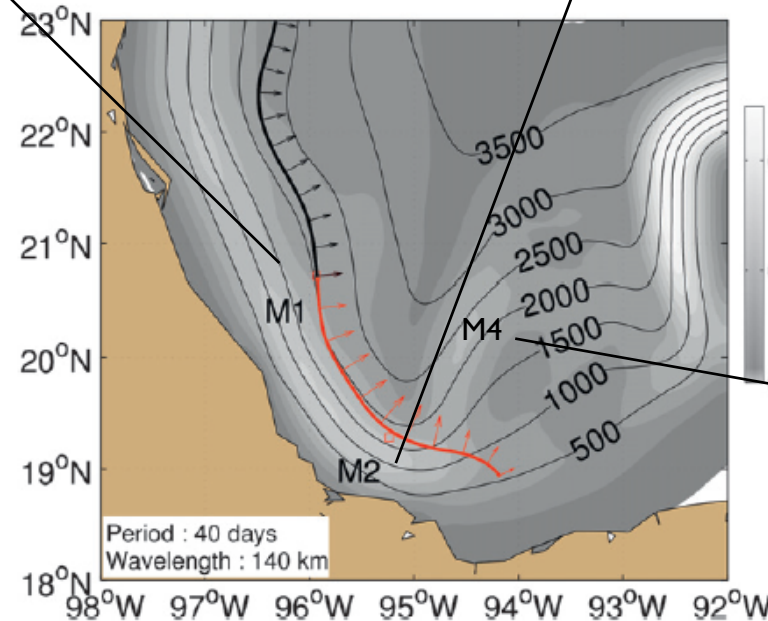


# TRWs in the Bay of Campeche (BOC)

TRWs propagate from M1 to M2 along the western slope and dissipate east of BOC



Periods: 5-60 days  
Horizontal wavelengths: 90-140km  
Vertical (trapping) scales: >700m



- 1) Intermittent deep currents (10 to 30 days) associated to surface confluent flows between cyclonic and anticyclonic eddies.
- 2) Decoupling between upper and deep circulation: deep dipoles beneath Loop Current eddies?
- 3) Mean circulation on the deep western Gulf of Mexico is cyclonic with large variability over irregular topography east to Bay of Campeche.
- 4) Topographic Rossby waves (TRWs) along the western Gulf of Mexico.