

# Presentation of Ongoing French Projects

## 1/ Projects funded by Agence Nationale pour la Recherche (ANR)

- ANR Colibrea (Tanzanie - C. Tiberi - Coll. US - 2012-2015)  
    ➔ C. Ebinger
- ANR DoRA (Afar, Djibouti/Ethiopie - C. Doubre - 2009-2014)
- ANR YOCMAL (Aden, Yemen/Socotra/Oman - S. Leroy - 2008-2012)

## 2/ Projects funded by Institut National des Sciences de l'Univers (INSU)

- Seismic experiment in Eastern Afar (Djibouti - C. Doubre - Coll. US - 2012-2015)
- Actions Marges :- Volcanism / Structure during extension
  - Deep Structure and heat flux
  - Erosion and sedimentation in Basins

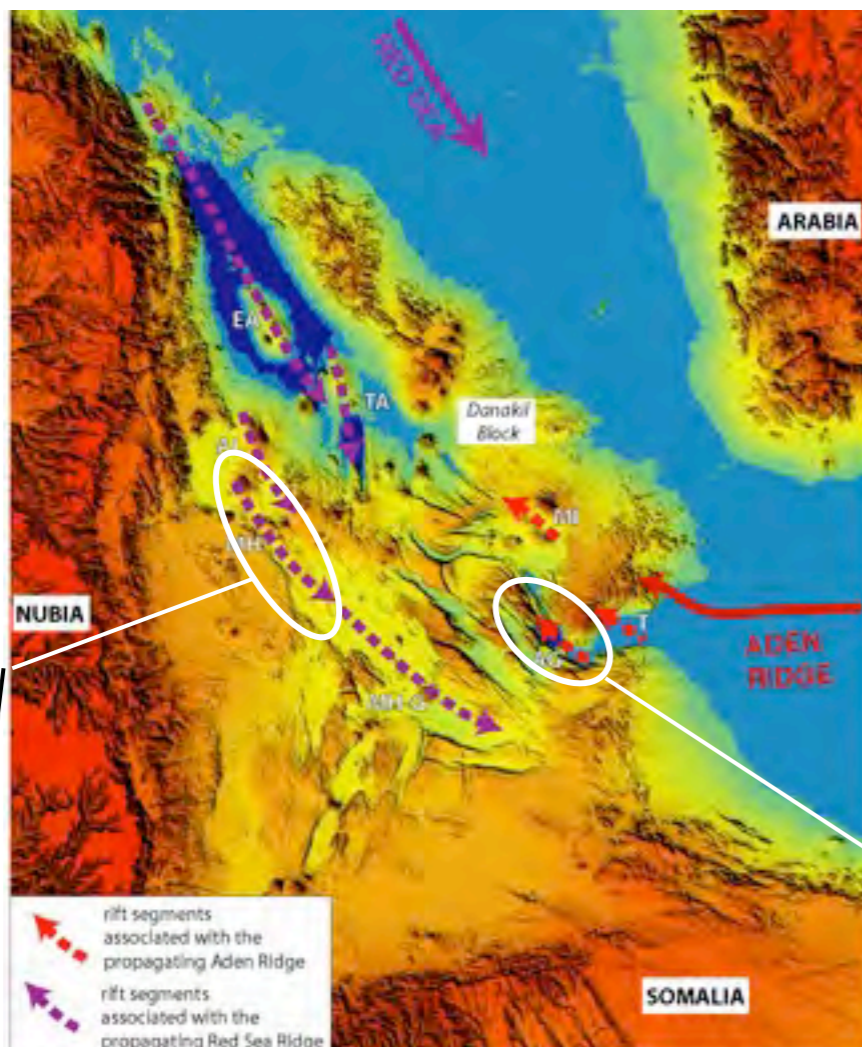
# ANR - DoRA (Dynamics of Rifting in Afar)

Pl: Cécile Doubre et al.

Multidisciplinary project focusing on the **dynamics of divergent plate boundaries**

- Magmato-tectonic interactions
- Near-Field and Far-Field Velocity Field
- Transient deformation

Studied Area : Afar - the Manda Harraro Rift segment (Ethiopia)  
- the Asal-Ghoubbet Rift segment (Djibouti)



Manda-Harraro Rift Segment  
Rifting Episode: Sept 2005-?

Asal-Ghoubbet Rift segment  
Rifting Episode: Nov. 1978

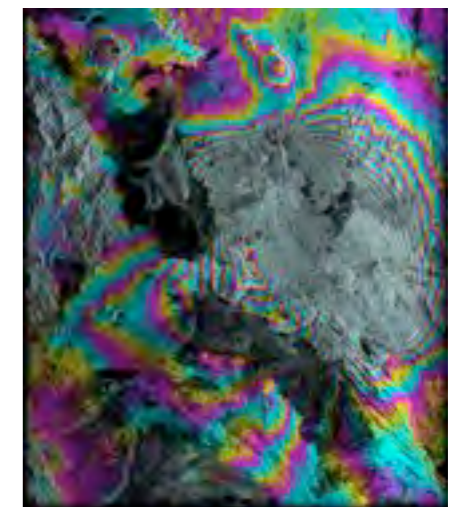
Objectives :

**Map the space / time evolution of the deformation**

- Manda Harraro Rift Segment
  - Large deformation
  - Magmatic activity
  - Magmatic Dilatation



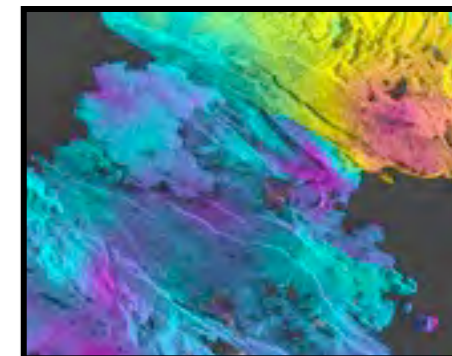
Set up of new measurement time series  
*cGPS / GPS camp / InSAR / Gravi*  
Monitoring Seismic Activity



- Asal-Ghoubbet Rift Segment
  - Small deformation
  - Few Magmatic activity
  - No Magmatic Dilatation ?



Continuation of measurement time series  
*cGPS / GPS camp / InSAR / Gravi*  
Monitoring Seismic Activity

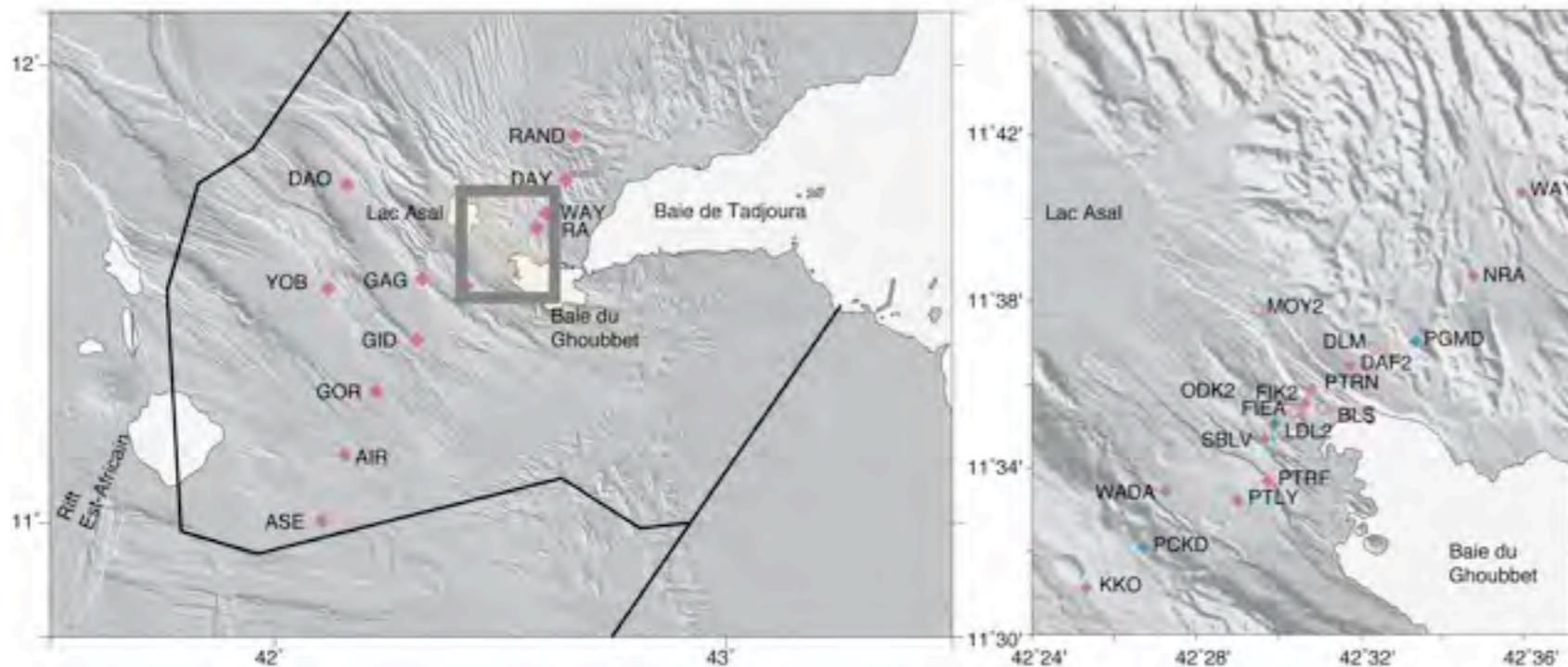




# Seismic Experiment in the Asal Rift (Afar, Djibouti)

PI: Cécile Doubre et al.

**150-km long profile across the Asal Rift with high density of stations at rift axis**



Nb of stations : 33  
Station spacing : 0.5 to 15 km  
Time span : 11/2009 – 03/2011  
Data recovery : ~ 70%

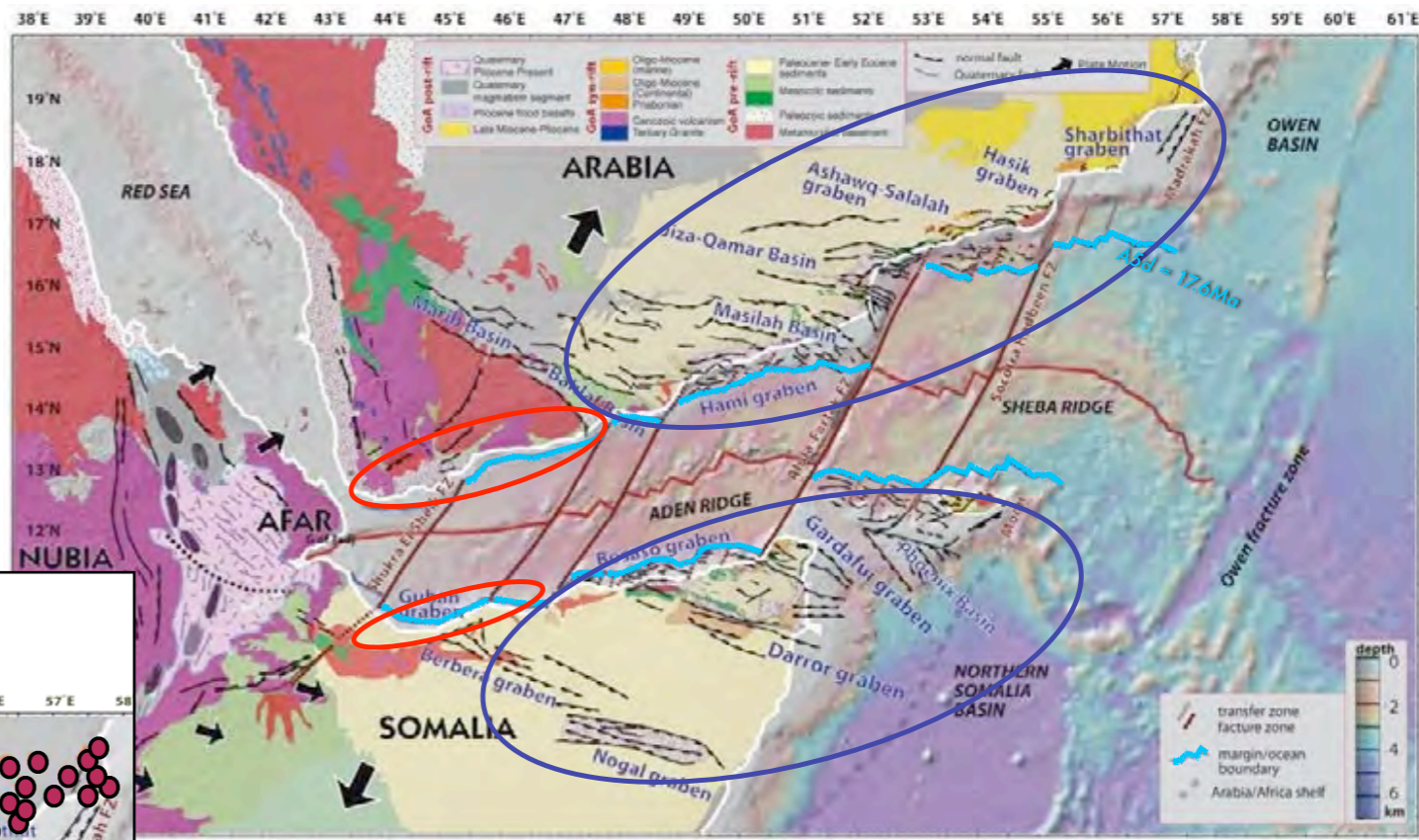
Receiver Functions  
Ambient Noise Tomography  
Seismicity Monitoring in E-Afar

- ➔ Lithospheric structure associated with the incipient plate boundary
  - Shallowing of the Moho depth (from 20 to ~8 km) within 15 km lateral distance
  - Asymmetrical / dipping structures
  - Large melt zone below 17 km (diapir head)
- ➔ Crustal structure at the rift axis
  - signature of large normal faults
  - presence of superficial magma chambre below the main volcanic center
- ➔ Seismic activity
  - E-Afar seismicity
  - 2010 seismo-volcanic Aden event



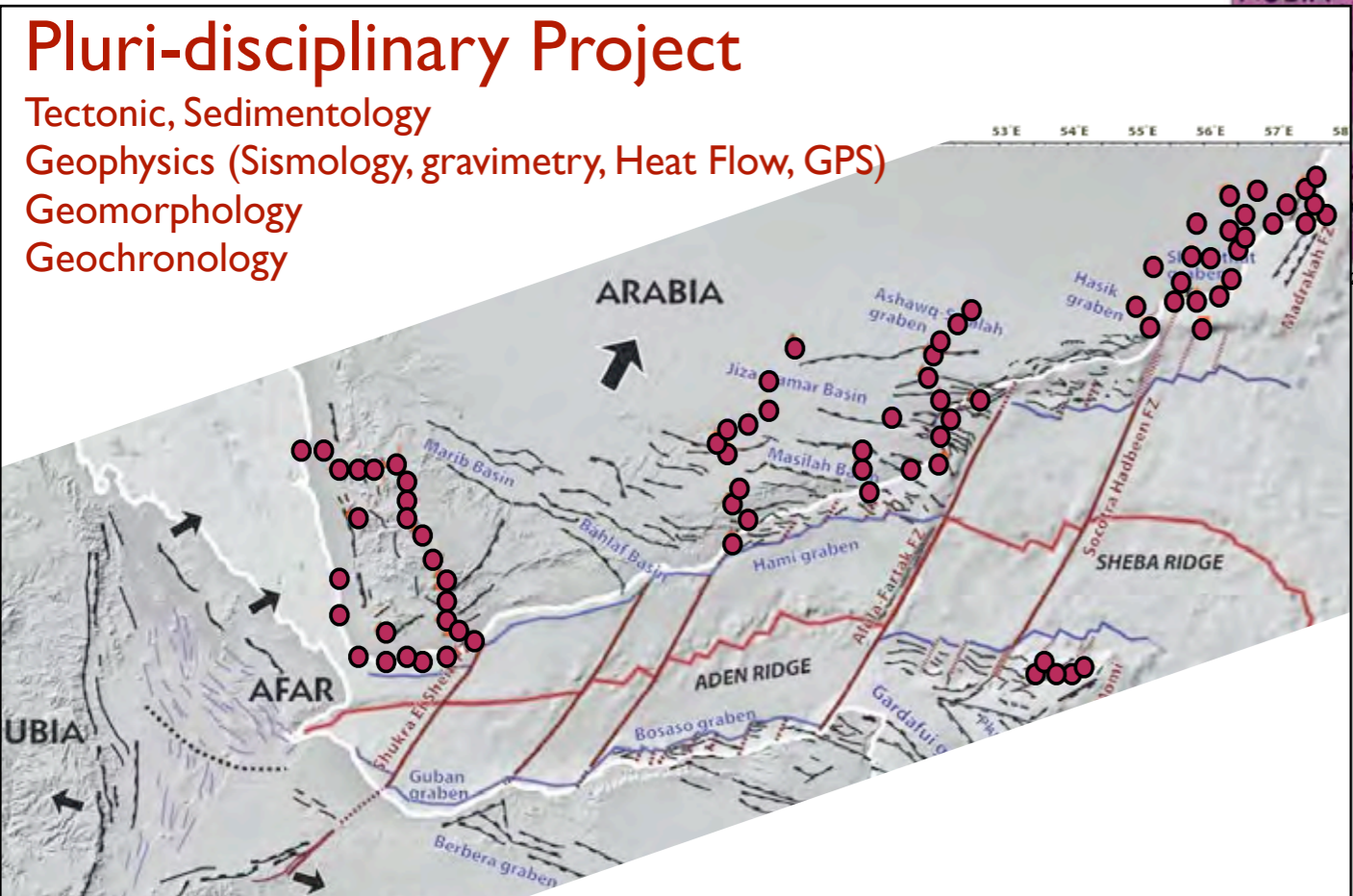
• Volcanic in the west & non volcanic in the east  
Oblique rifting - Segmentation 1st & 2nd order

- Structures responsible for stretching & extreme thinning of the lithosphere
- Inheritance & rheological and thermal evolution during and after rifting
- Role of magmatic process on the developpement and evolution of the margins



**Pluri-disciplinary Project**

- Tectonic, Sedimentology
- Geophysics (Sismology, gravimetry, Heat Flow, GPS)
- Geomorphology
- Geochronology



**Seismological networks**



**Field geology**



**Multichannel seismic**



**Refraction OBS**



**Heat Flow HR**

