Presentation of Ongoing French Projects

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

  ➡ 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
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)

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)  

Pl: Cécile Doubre et al.

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

- **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

**Receiver Functions**
- Ambient Noise Tomography
- Seismicity Monitoring in E-Afar

- **Number of stations**: 33
- **Station spacing**: 0.5 to 15 km
- **Data recovery**: ~70%
Structures responsible for stretching & extreme thinning of the lithosphere
Inheritance & rheological and thermal evolution during and after rifting
Role of magmatic process on the development and evolution of the margins

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

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 development and evolution of the margins