

The kinematics of Iberia revised. The first step for a restoration of the Mesozoic Tethys

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Gianluca Frasca^{1,2}

Gianreto Manatschal², Patricia Cadenas²

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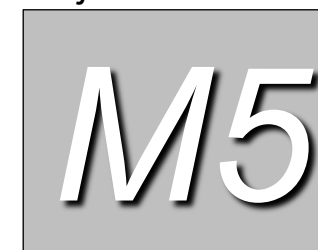
¹*Institute of Geosciences and Earth Resources (IGG), National Research Council (CNR), Via Valperga Caluso 35, 10125 Torino, Italy*

²*IPGS, EOST-CNRS, Université de Strasbourg, 1, Rue Blessig, 67084 Strasbourg, France*



e-mail address: gianluca.frasca@cnr.it

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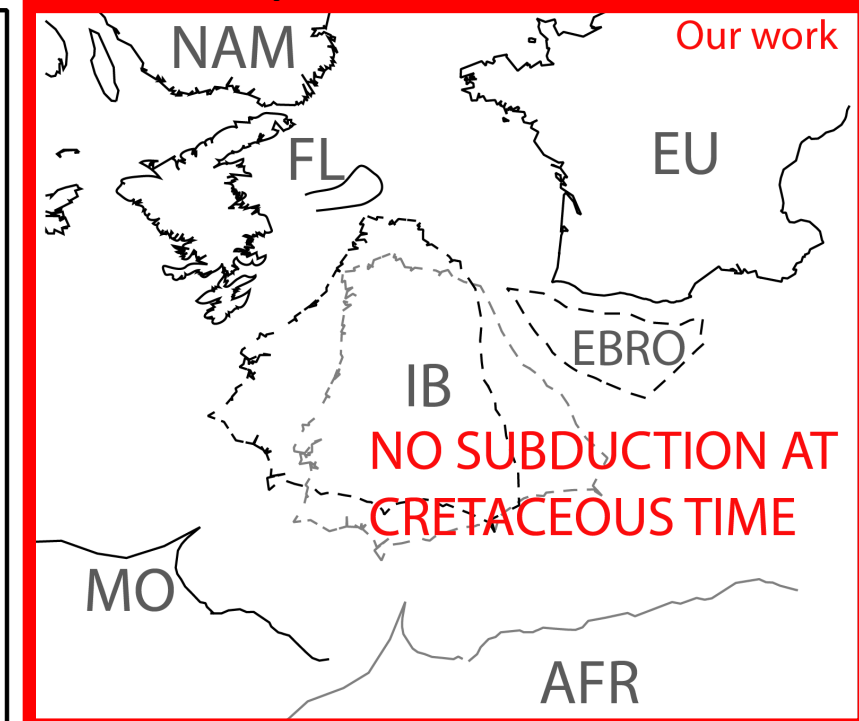
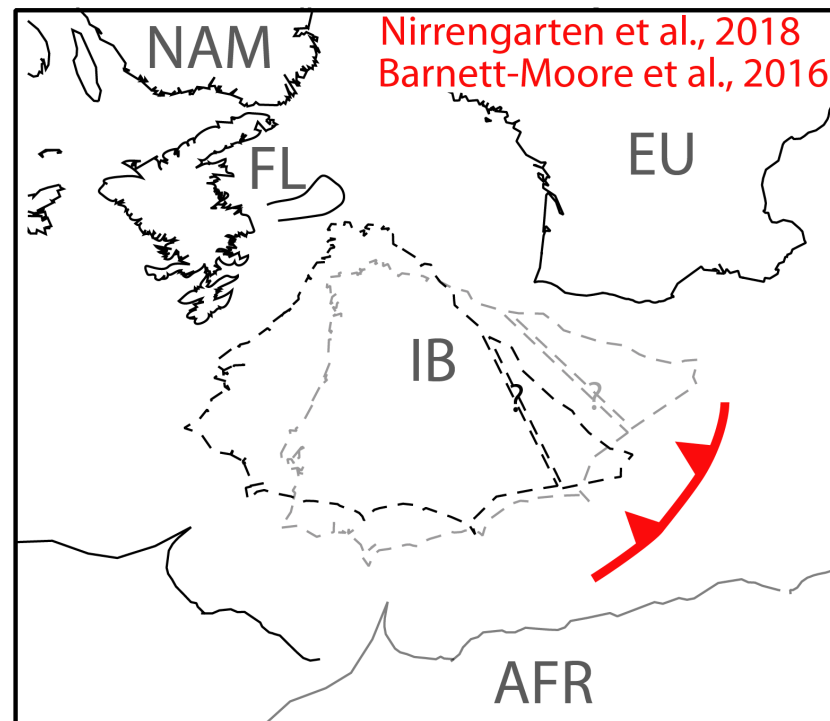
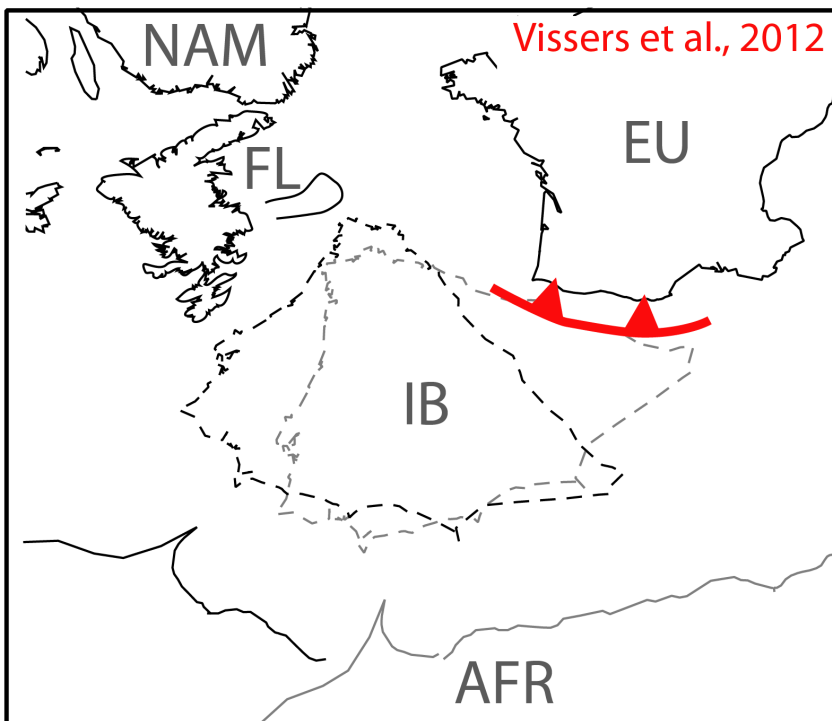


Problem

How to define plate motions during rifting stages?

Case-study: Iberia (IB), North America (NAM), Europe (EU), Africa (AFR)

Literature: 3 main “schools of thought” = 3 consequences E of Iberia for the Alpine restorations



Sketch view of three end-member solutions for the restoration of Iberia

Frasca et al., in prep.



120 Ma to 112 Ma

NAM

EUR

EBR

Frasca et al., in prep.

NWAFR

In white deforming areas and oceanic domains

Motion in deforming areas can be accommodated in different positions through time

Relative velocity vector $\sim 9 \text{ mm yr}^{-1}$

Spreading ridge/Rift axis

Transform/Transfer

Necking line

ECC (Edge Continental Crust)

LaLOC (Landward Limit Oceanic Crust)



Points for discussion

Which observations are key for constraining kinematic models based on rifted margin tectonics?

Importance of deforming models in avoiding “rigid” position of plate boundaries

Resolution/error bars on velocity vectors

Absolute value? Velocities at least must be coherent with motion relative to other plates.

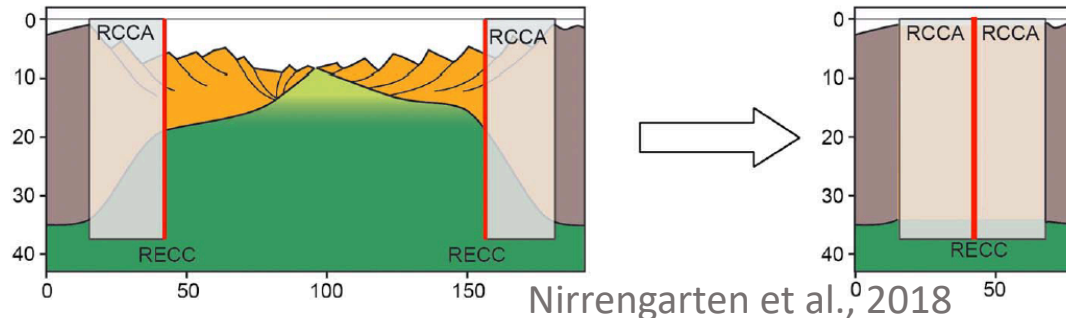
Here no acceleration of Iberia relative to plates around

➡ There is indeed no subduction driving motion of Iberia in the Tethys at Cretaceous time

“Mind the pixel!” when comparing kinematic results with geological data

For a rifted margin of ~175 km and possible error in positioning Moho at depth of ± 3 km

➡ Possible error in estimation volume of ~1000 km³. In plane view it means error in positioning of RECC of ~30 km



Nirrengarten et al., 2018

~30 km, i.e. ~thickness of the crust,
as value resolution “Pixel”?

If interested in the work, do not hesitate to write me an e-mail: gianluca.frasca@cnr.it



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*The Early Career Scientists (ECS) team of the EGU Tectonics and Structural Geology (TS) Division is launching a **new initiative** - a community-wide paper discussion forum!*

*In this initiative, **TS “Must-read” papers** will be selected and discussed by the TS community. Papers covering any TS subject are welcome, from fundamental, seminal papers to just-published ground-breaking articles. We suggest you try to answer the question “if I could only suggest a handful of articles to a starting TS researcher, which ones would they be?” and then go vote here: <https://tinyurl.com/yc7vwm2m>*

*We’ll then promote the most voted contributions (total number to be decided depending on input) and moderate their discussion on a **public forum** (Reddit).*

*Aside from the discussion, each paper will lead to **two main outputs** that we also hope will be useful for all of us TS ECS, and hopefully for other TS researchers too! A **summary post** in the EGU TS Blog will summarize the content of each article as highlighted by discussion participants. The final output of the action will consist in a **compilation of all posts** that will be permanently archived on a preprint server (EarthArXiv).*

Voting will take just 3 minutes of your time, so we hope to get your opinion soon!

*Thank you very much in advance,
The ECS “TS Must Read” working group*