

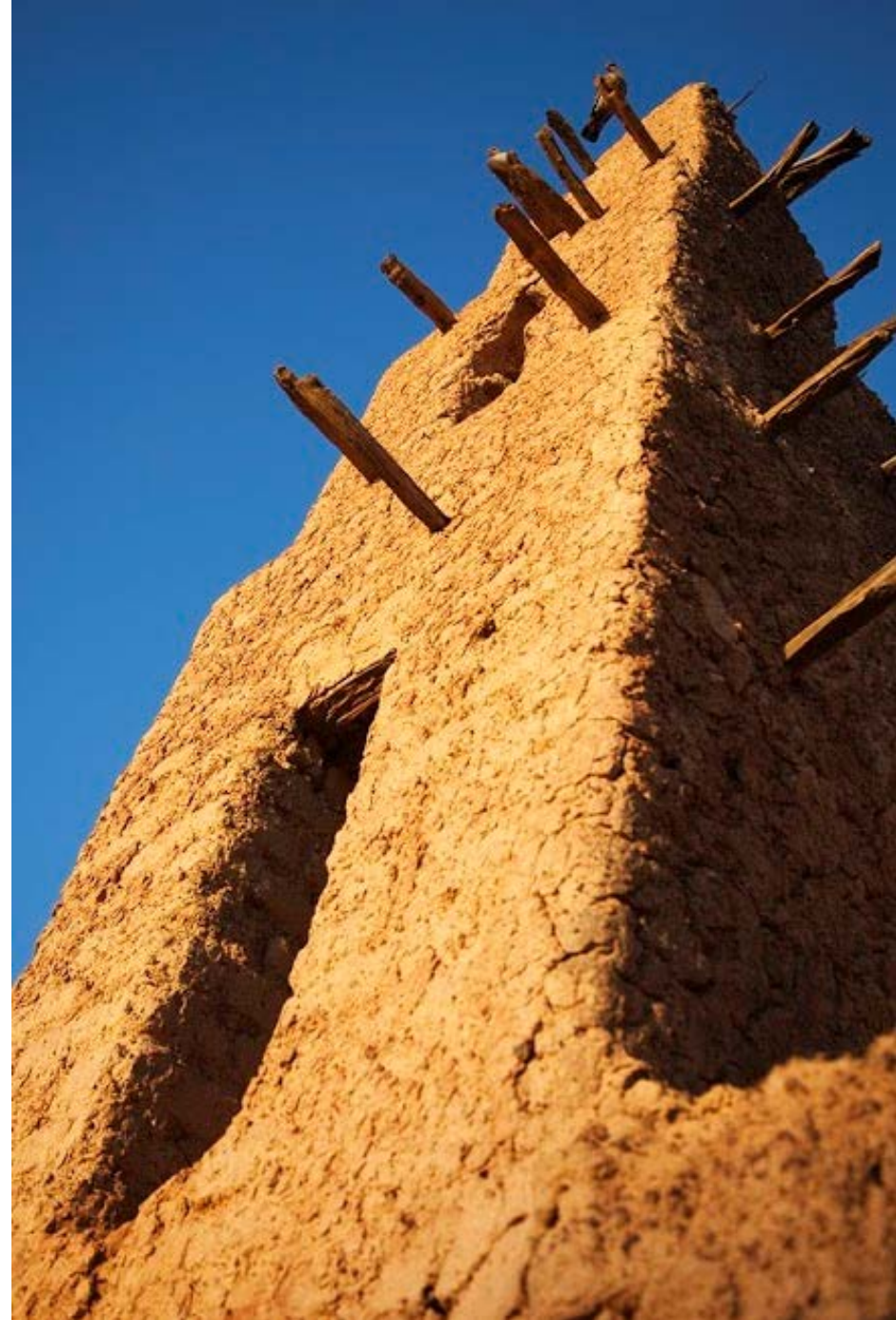


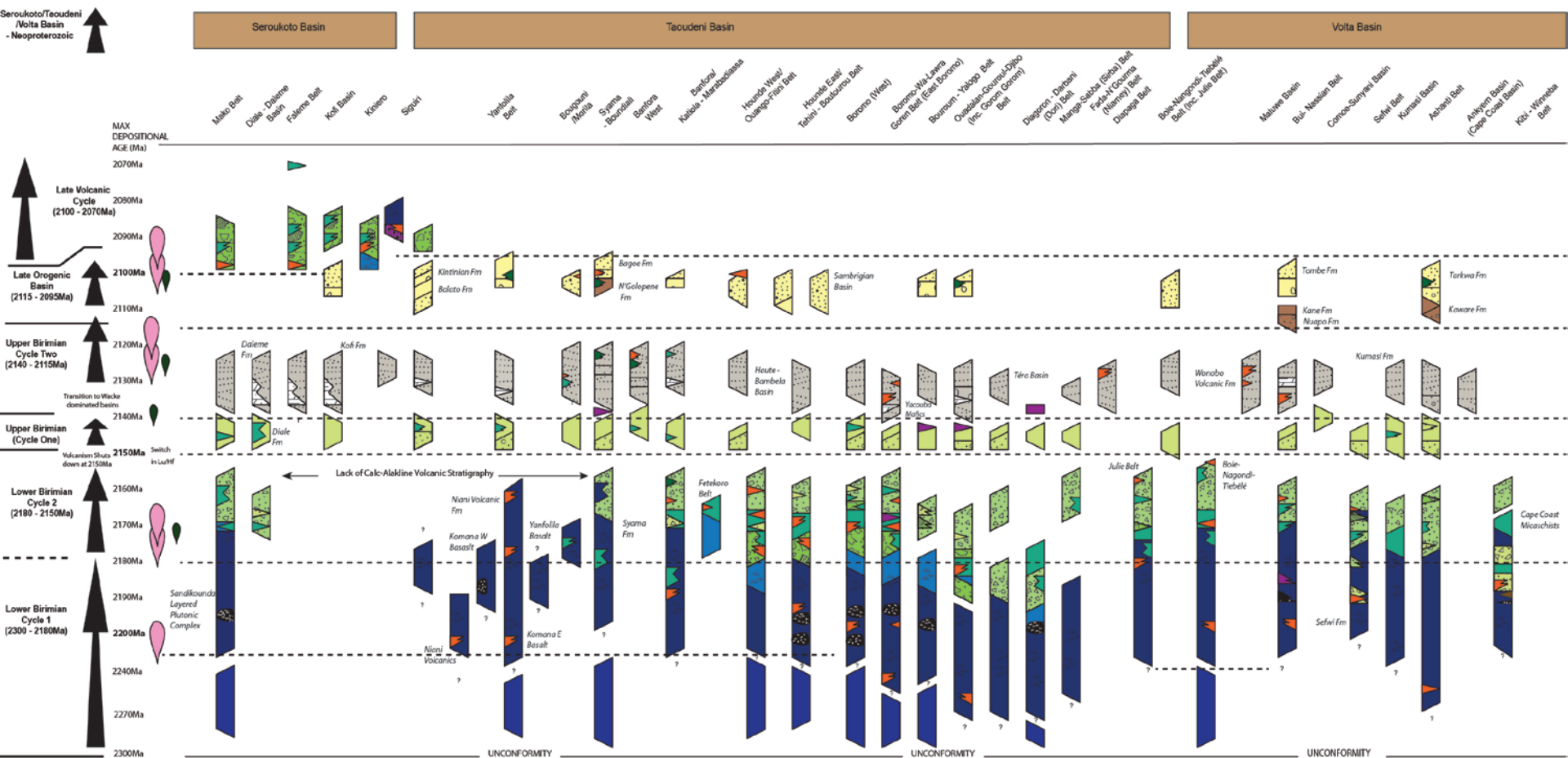
WAXI- West African Exploration Initiative
IXOA- L'Initiative d'Exploration Ouest Africaine

P934A West African eXploration Initiative

***Regional-scale lithostratigraphic correlation
of the Paleoproterozoic Baoulé-Mossi domain***

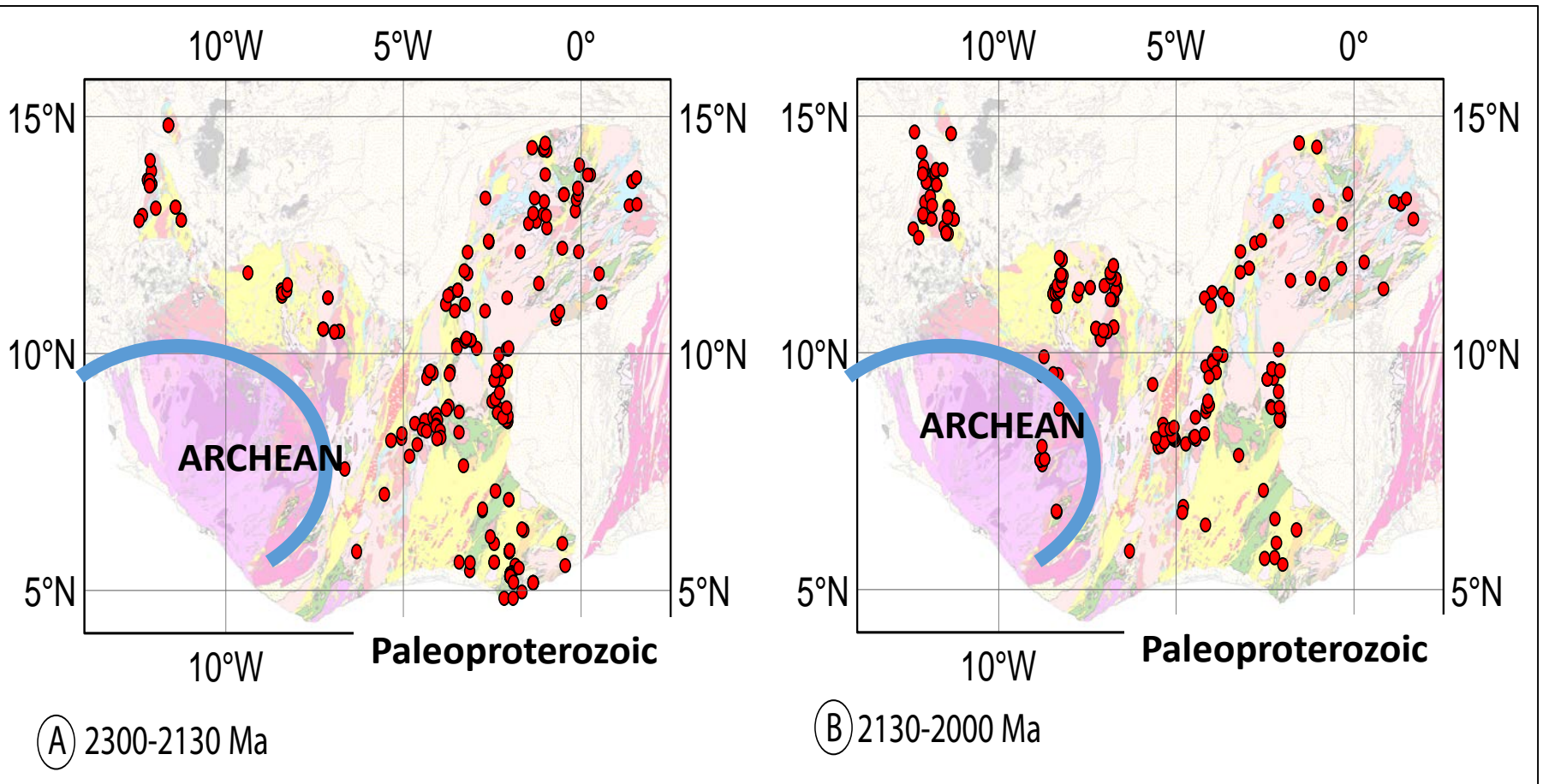
James Davis, Luis A. Parra-Avila, Nicolas Thébaud,
John Miller, Cam McCuaig, Marco Fiorentini,
Graham Begg, Mark Jessel, Kim Hein, Lenka
Baratoux and Nuru Said



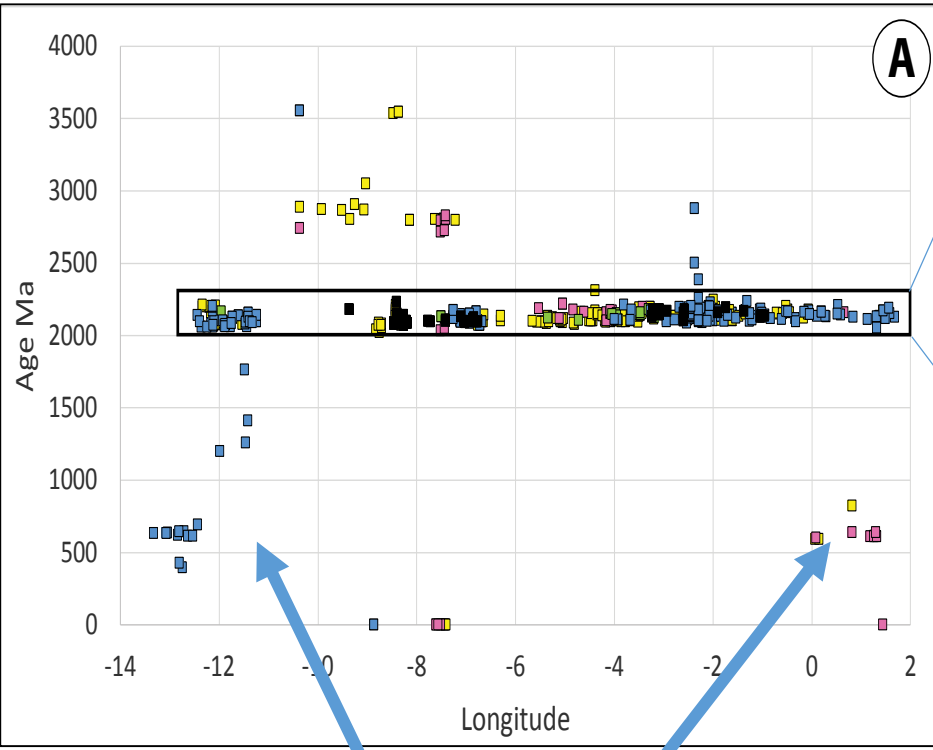


Geochronology

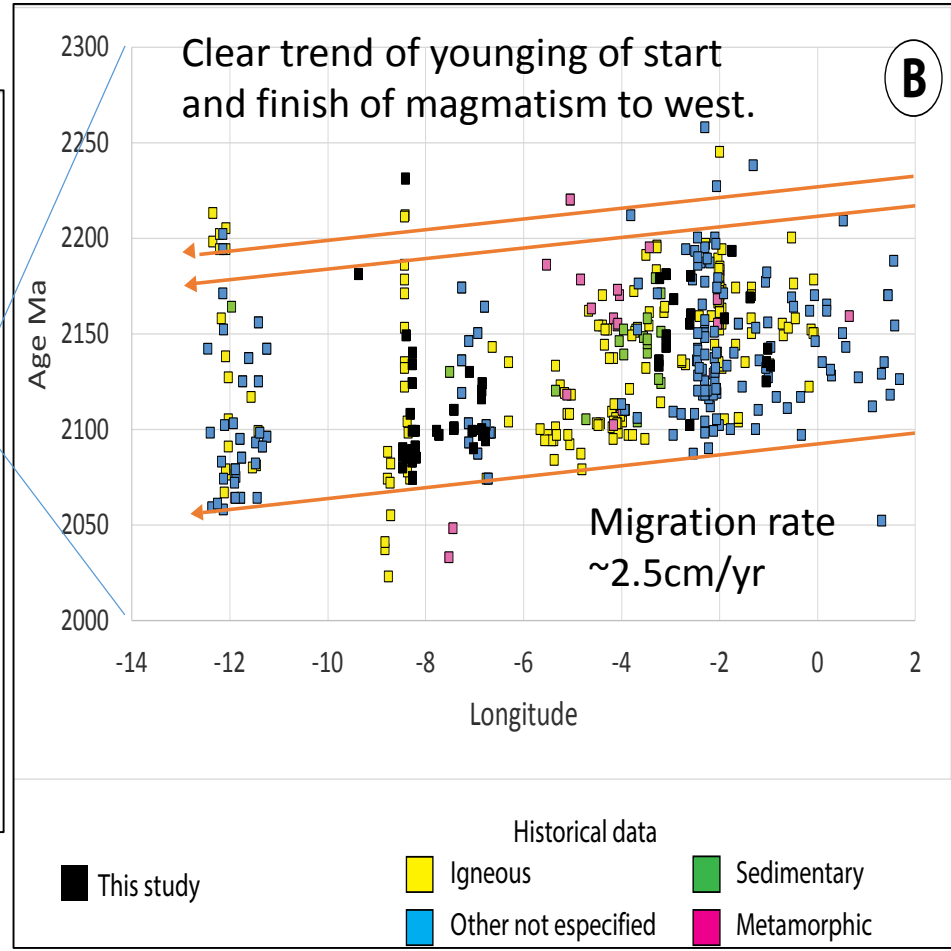
New and historical zircon age distribution across the WAC



Geochronology

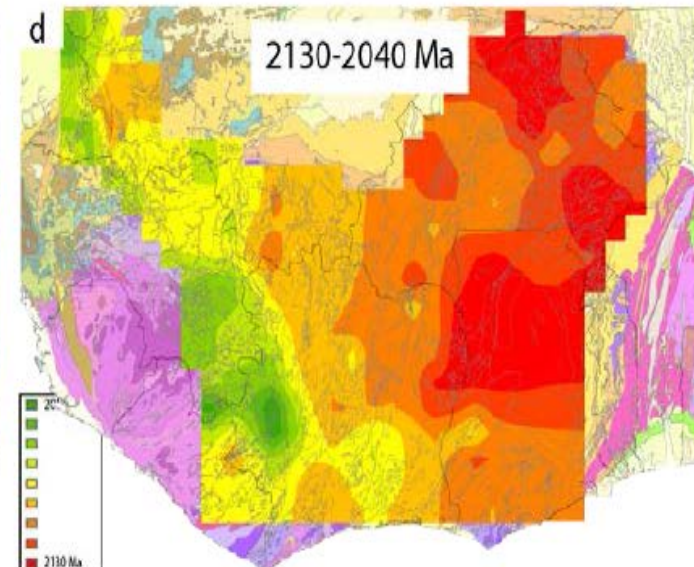
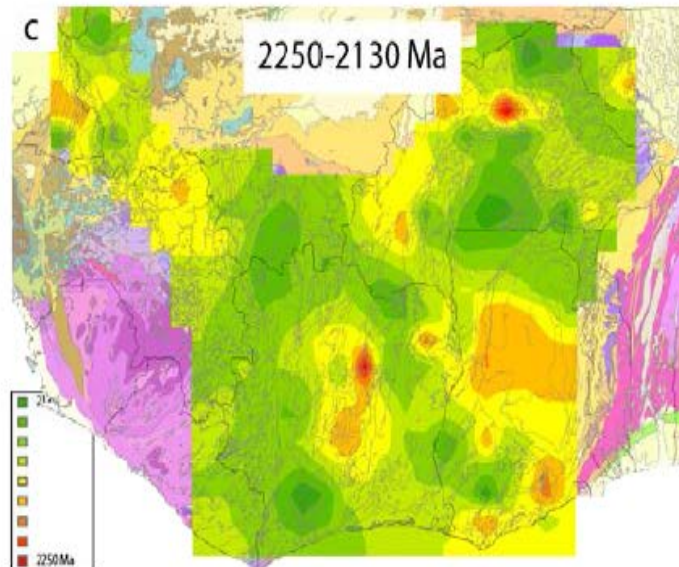
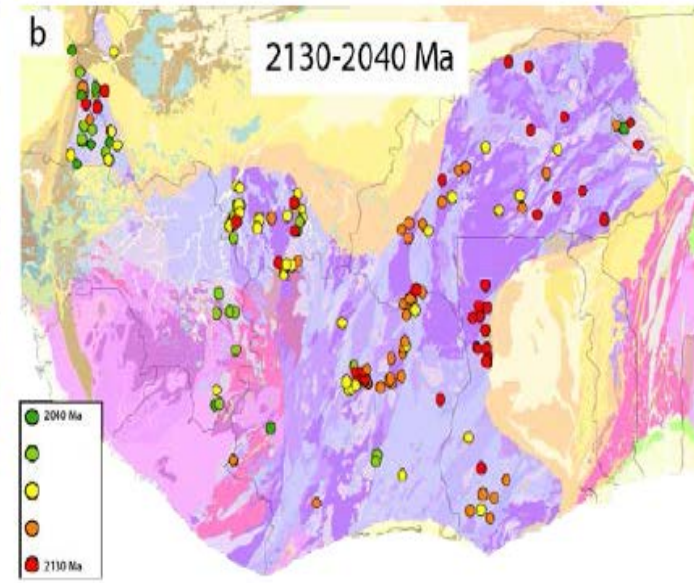
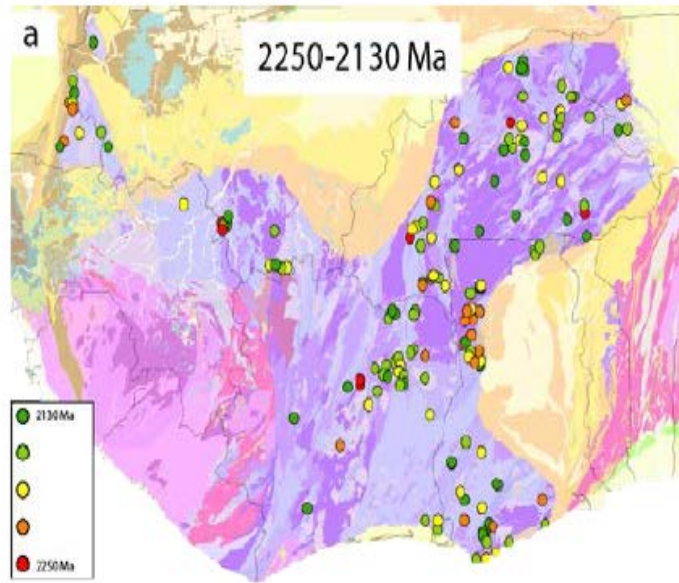


Reactivated
Craton
Margins

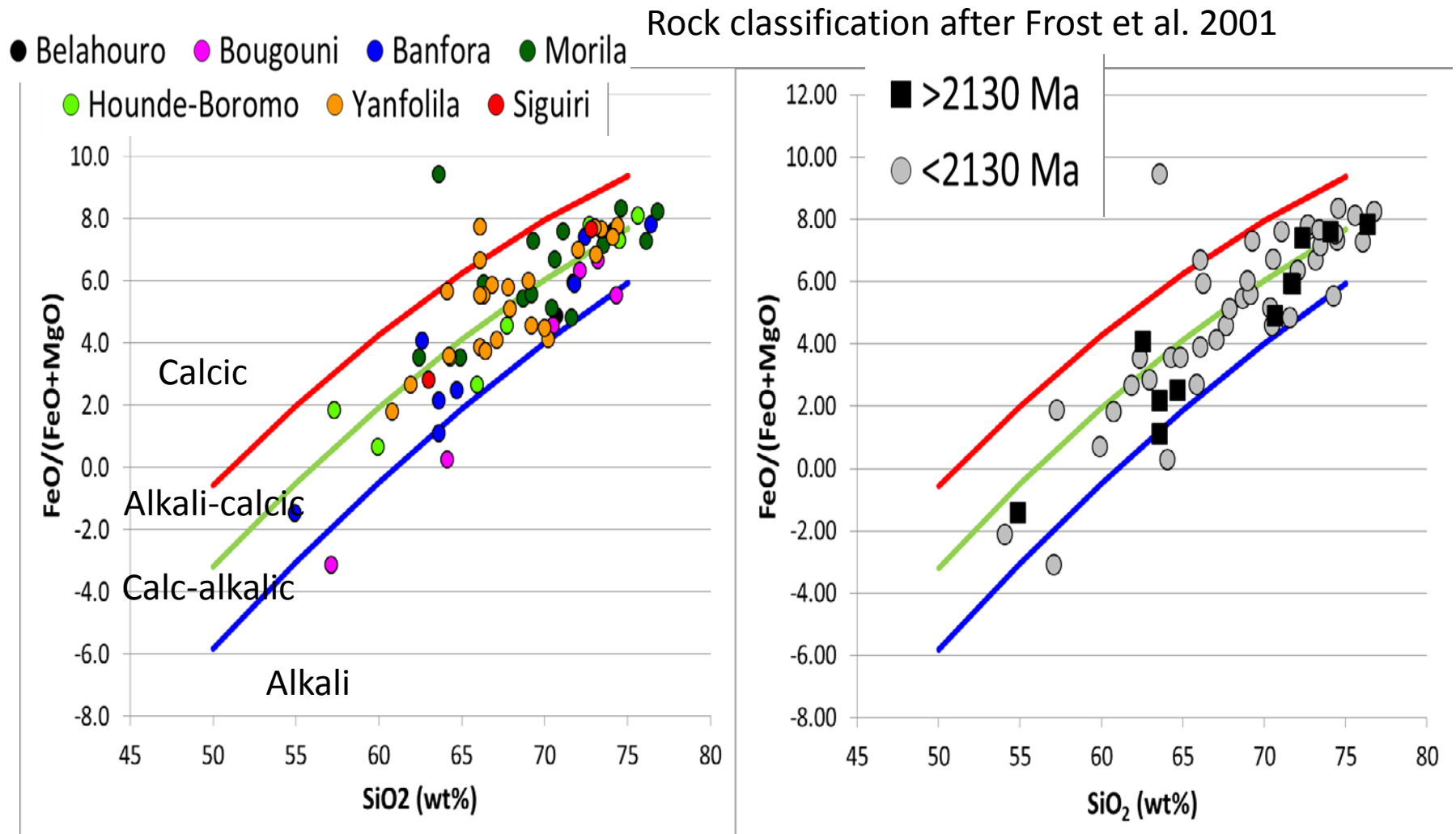


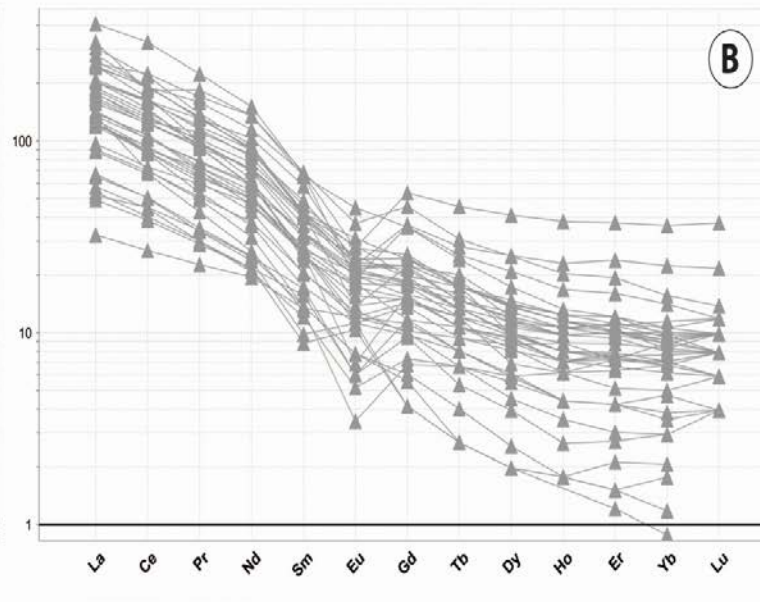
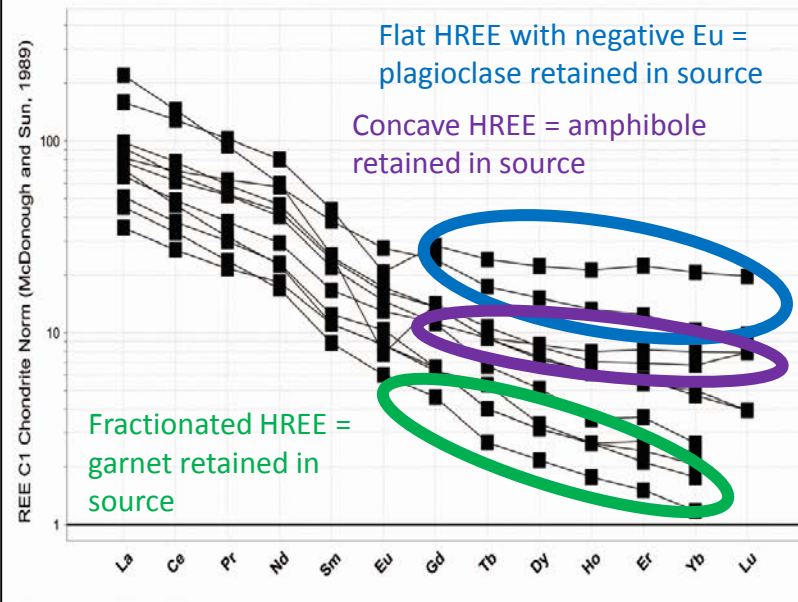
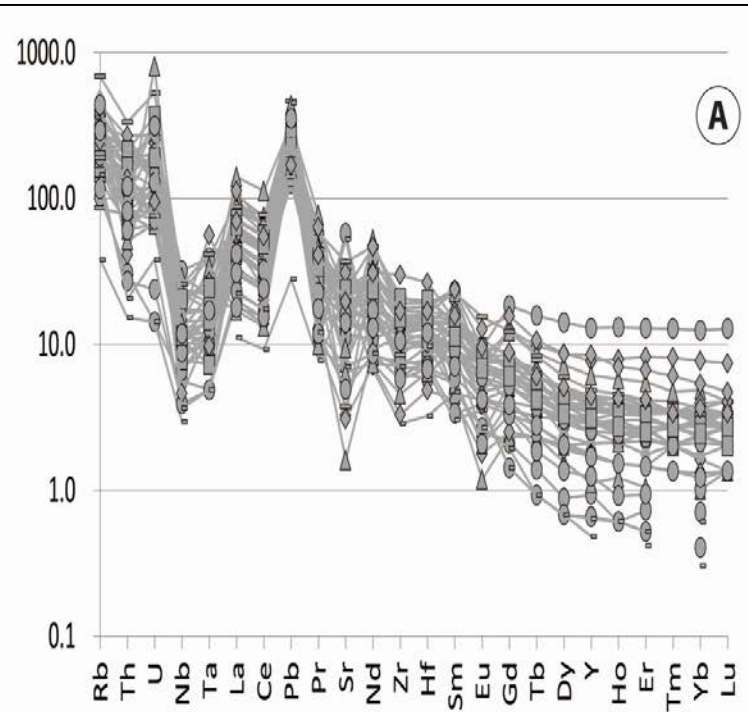
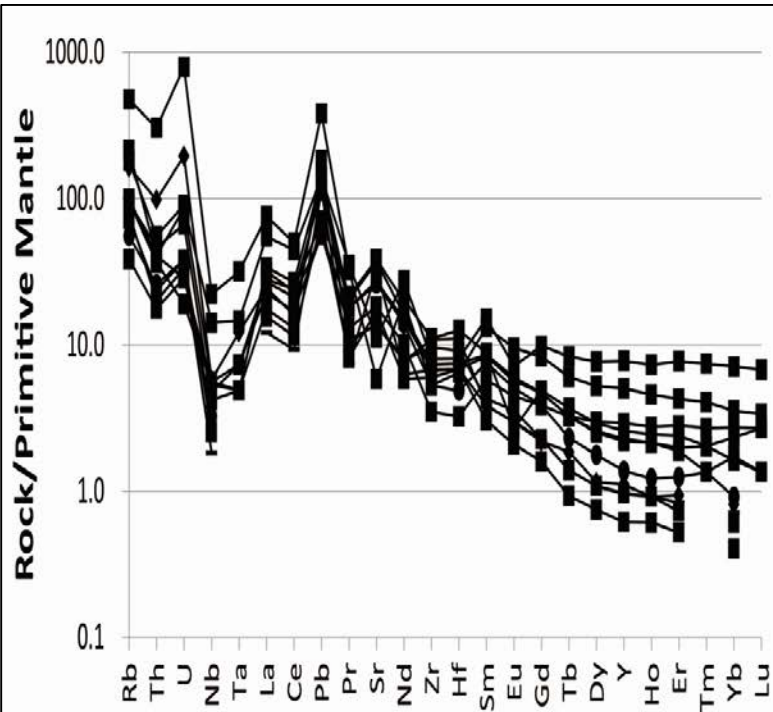
Geochronology

Starting to
image
assembly of
the terrane



Felsic Geochemistry

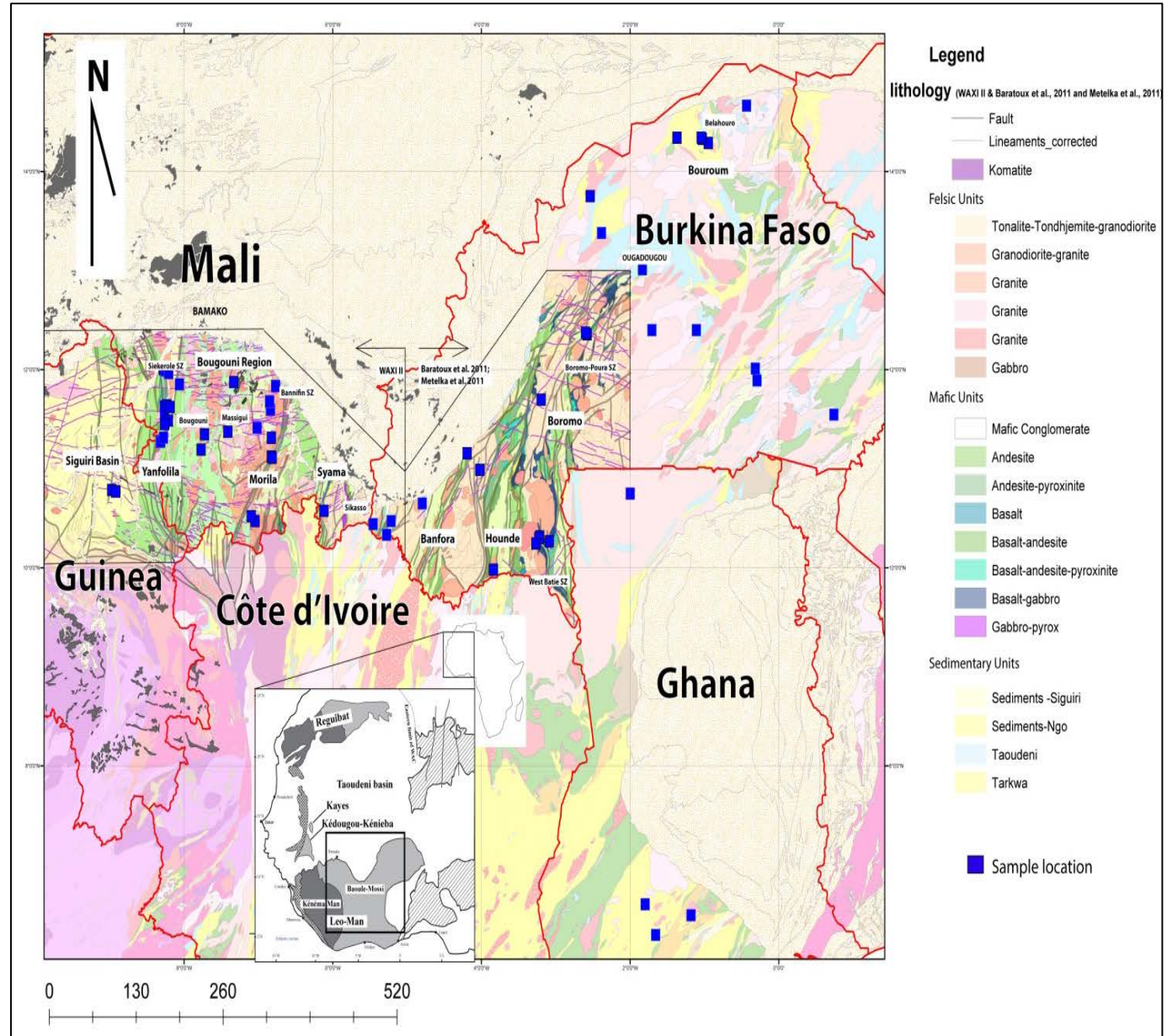




Felsic Geochemistry

- From the previously described patterns it is possible to identify two main magma compositional types:
 - magmas derived from sources with residual garnet, associated with higher pressures and slightly less degrees of differentiation (more prevalent in older samples)
 - magmas derived from source with residual plagioclase, related to lower pressure of melting and increasing magmatic differentiation and/or source enrichment (dominant in younger samples)
 - Most belts show both types

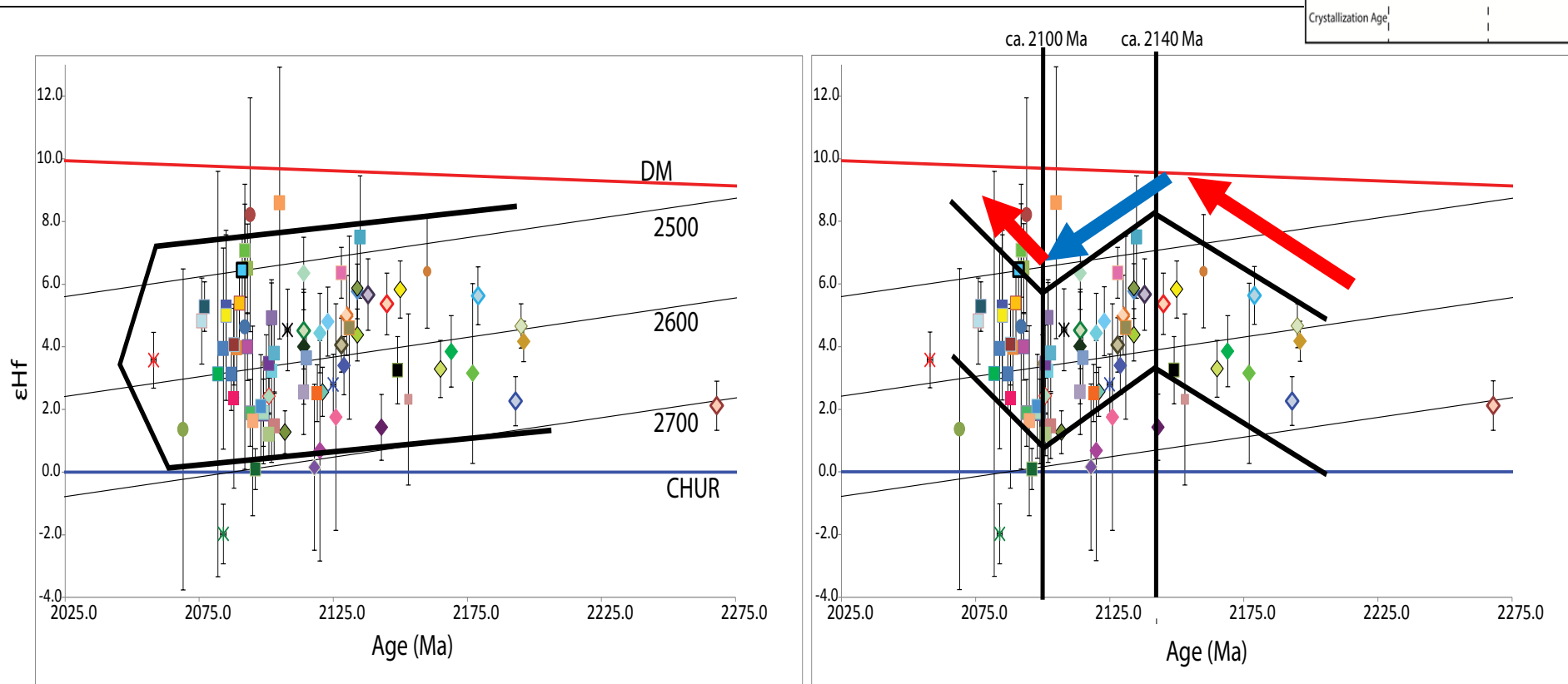
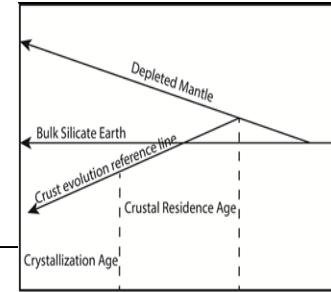
Isotopes Lu-Hf, O (zircon)



Epsilon Hf... Two possible interpretations....

Either way, the data require a contribution from material >2.5Ga

D3 D2

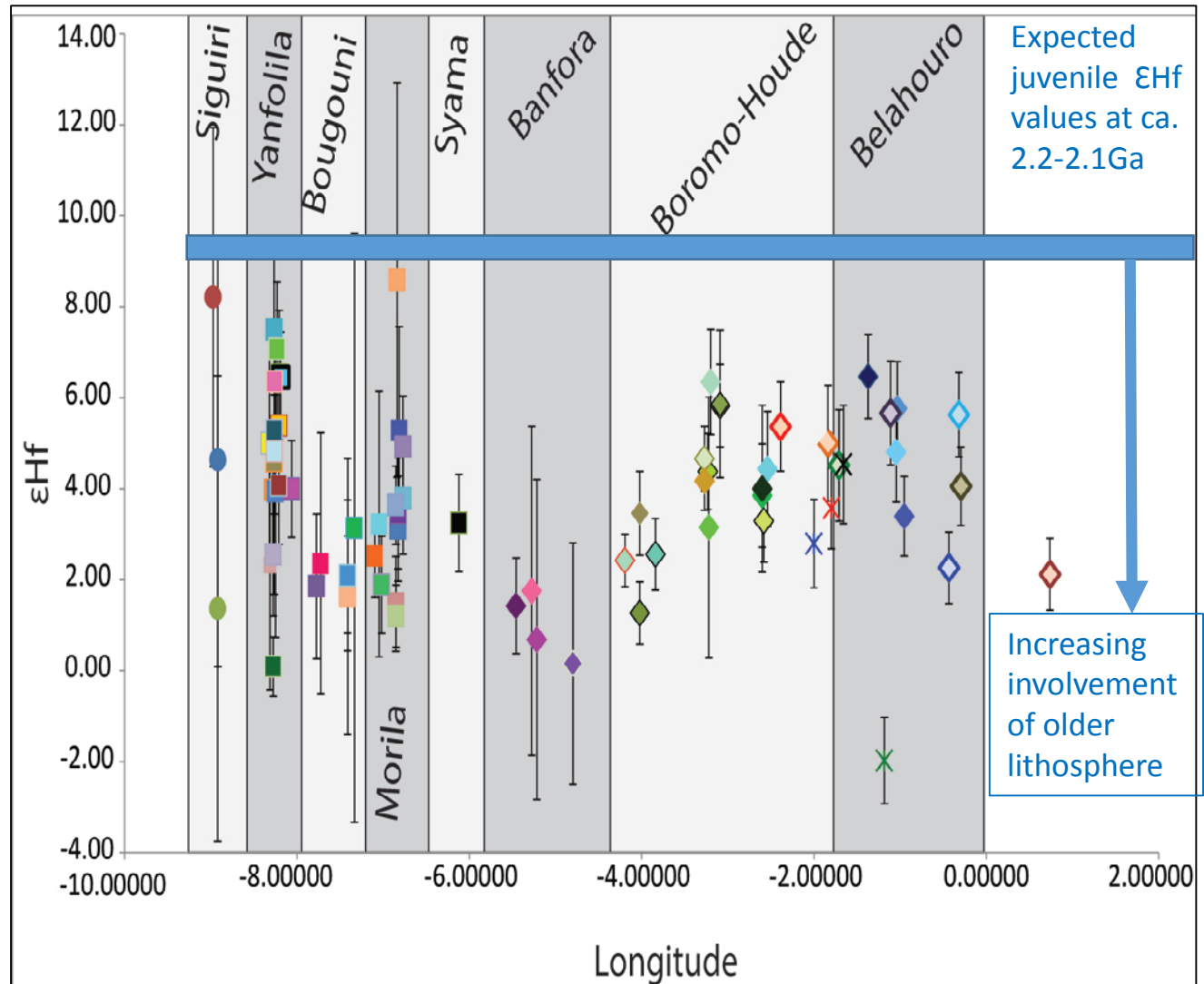


← Crustal growth ← Crustal reworking

Hf Isotope Data by Latitude

Variability of the epsilon Hf signature, notice it is larger particularly along the Yanfolila and Morila Belts

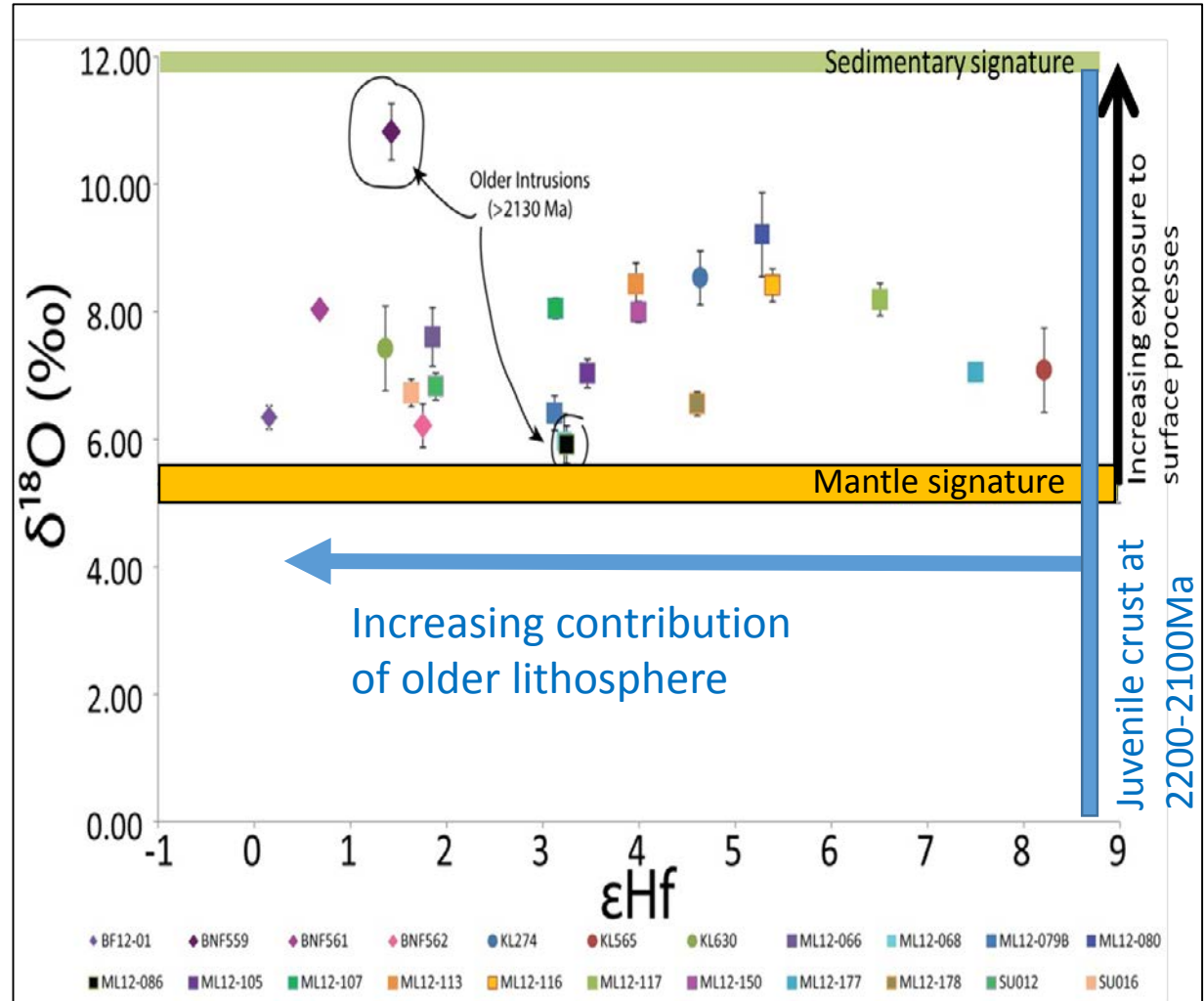
Reflects variable proportion or age of older material incorporated into melt source zone



Oxygen Isotopes

No clear correlation between Hf and O data

Require variable (but strong) input from material altered by surface fluids



So how we create the magmas?

Need: (1) arc-like trace elements, (2) older lithosphere, (3) significant surface material; (4) variably fractionated HREE in each belt

- melts of hydrated mafic crust interacting through relatively thick (>35 km) continental lithosphere (variable garnet-plag signature, surface oxygen); and/or
- Fractionation/melting across a range of pressures (across gnt-plag stability field)
- Partial melting of older shallowly-subducting slab interacting with mantle wedge (old Hf, variable surface oxygen);
- Partial melting of metasomatised mantle wedge at relatively shallow depths (garnet-plag variation) contaminated with subducted sediments (old Hf, variable surface oxygen).

WAXI3 (in progress...)

- Detrital U-Pb, Lu-Hf,-O isotope study of zircons from Birimian sedimentary rocks
- Guinea – transect across Birimian-Archaean boundary for U-Pb, Lu-Hf,-O isotope study of zircons.
- Cote-D'Ivoire, KKI – filling in the blanks
- Isotopic maps of lithospheric architecture through time
- Chemistry mapped to architecture
- Mineral systems mapped to isotopic maps



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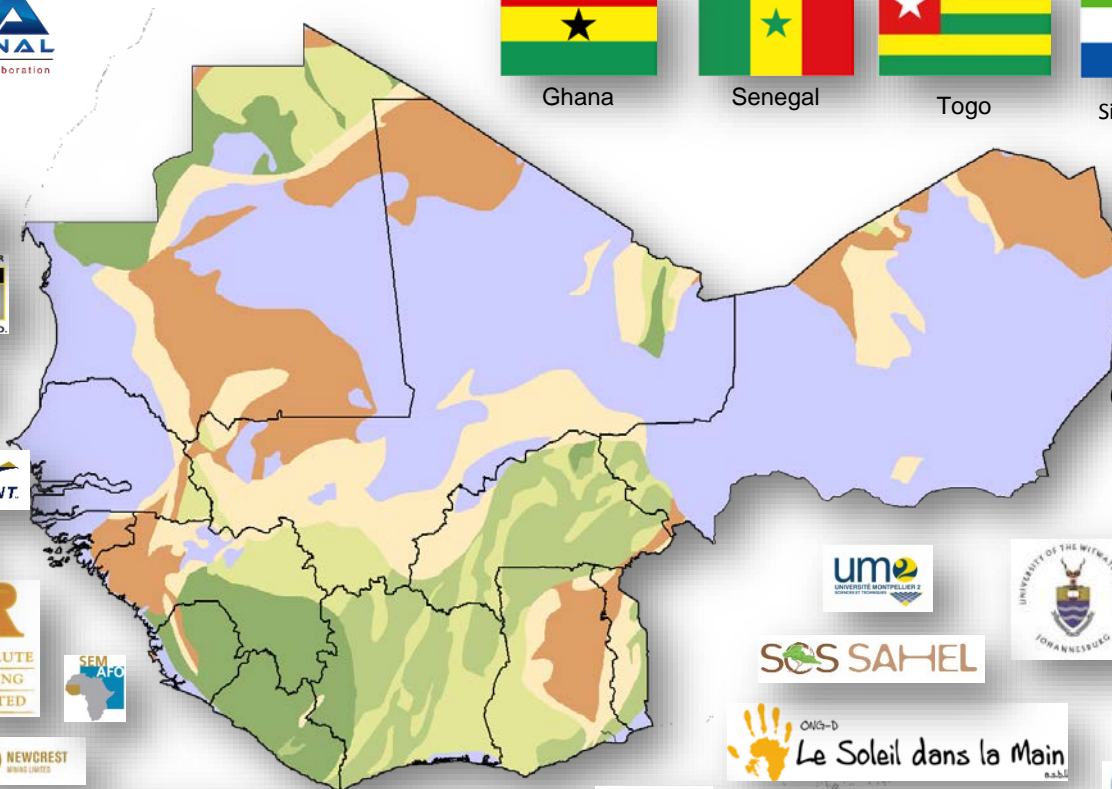


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