

## Overall impression

The previous referees highlighted the most important issues, to which the authors have responded well in my opinion. The manuscript is well-structured and reads well.

One important reference still missing is von Eynatten (2003): Petrography and chemistry of sandstones from the Swiss Molasse Basin: an archive of the Oligocene to Miocene evolution of the Central Alps. *Sedimentology* 50, 703-724.

I am not sure if the use of “Penninic” is the correct or most specific term to refer to the Lepontine dome. Schmid et al. (2004) prefer to call the Lepontine nappes “sub-Penninic” nappes, because they are structurally located below the “classic” Penninic nappe stack (Valais ocean + Briançonnais + Piedmont-Liguria ocean), but paleogeographically they are connected to the European basement. “Penninic” in many Alpine geologist’s heads will be confusing in this context, so I suggest to use the more specific term “Lepontine dome” or “Lepontine nappes”, and eliminate “Penninic”.

I suggest below some minor changes by line:

## Detailed comments by line

Line 27: This is the first time you mention Lepontine dome, whereas you referred to “Penninic units” before. The reader not familiar with the Alps will be confused. Stick to one of the two terms in the abstract

Line 46/47: “detailed” is used twice, eliminate one

Line 49/50: either “origin of sediment” or “sediment provenance”, not “origin of sediment provenance”

Line 51: Füchtbauer needs a “ü”

Line 60: Malusà needs an “à”. Also in lines 688, 691, 701, 954, 1248

Line 143: Arabian (one “a” missing)

Line 156: Alpine geologists now prefer to address the Gotthard unit as a nappe rather than a massif...

Line 188: Pan-African, eliminate the “t”

Line 217: Penninic (one “l” missing)

Line 303-305: Füchtbauer connects the epidote to the Austroalpine nappes, not to the Penninic ophiolites (as you state yourself in line 305), so please remove this reference from line 303

Line 314: Swiss Foreland Basin (capital letters for consistency)

Line 382: delete “site”

Line 387: remove the comma after “while”

Line 685: delete “shift” after “provenance”

Line 686: et al. (“l” missing)

Line 708: river, not River

Line 766: “a spectrum that spans”

Lines 821-832: Could you here please comment on the expected zircon U/Pb spectrum from the external massifs? Would it be distinguishable from the Lepontine signature at all? Is there a similar dataset like the one from Malusà et al. 2013, but for rivers draining the external massifs? If not, you should at least comment on the available bedrock ages.

Line 847: "by" the occurrence of Cr-spinel

Line 890: "Alpine zircon was exhumed" or "Alpine zircons were exhumed"

Line 899: fining-upward ("- " missing)