

Reviewer #1 changes,

A small insert to line 63 was added (“synthesized by Boston et al., 2017”), but it distracted from the sentence to say the full request of the reviewer.

Reviewer #2:

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.

Response: It was referenced, but not added to reference list. It is there now.

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”.

Following the bulk of the geologic literature out there we chose to keep the term Penninic as these units were still part of the Penninic and not Helvetic realm. Changing the use of Penninic to “Lepontine dome” around the manuscript does not always fit since one is a geographic reference and the other is a paleogeographic reference. We add a bit of clarification in the abstract.

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

Added “including the Lepontine dome”

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

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

Line 51: Füchtbauer needs a “ü”
Fixed throughout

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

Line 143: Arabian (one “a” _missing)
Done

Line 156: Alpine geologists now prefer to address the Gotthard unit as a nappe rather than a massif... _
Changed (added to figure 1)

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

Line 217: Penninic (one “l” _missing)
Done

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.

Done

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

Line 382: delete “site” _
Done

Line 387: remove the comma after “while” _
Done

Line 685: delete “shift” _after “provenance” _
Done

Line 686: et al. (“l” _missing)
Done

Line 708: river, not River
Done

Line 766: “a spectrum that spans” _
Done

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.

Ages of bedrock added and additional clarification provided in line 825-829

Line 847: “by” _the occurrence of Cr-spinel

Fixed

Line 890: “Alpine zircon was exhumed” _or “Alpine zircons were exhumed” _

Fixed

Line 899: fining-upward (“-“ _missing)

Fixed