***The paper is much improved but there are still points that I think should be addressed:***

***-Different labs use different procedures, and thus introduce different sources of potential bias. The authors should either refer to a previous study where their specific procedure is described in full or provide more details about their separation procedure in the main text.***

As requested, we have added details to the Methods section (Line 125-131), which address our separation procedure for the apatite grains.

Lines 125-131 *"Samples were processed according to the external detector method for AFT dating, using standard methods. Bulk samples were first sieved with a 1.5 mm mesh, and heavy minerals were concentrated using standard techniques, involving the use of the Wilfley table and of heavy liquids. We separated the apatites from lighter minerals using a heavy liquid with a density of 3 g/cm$^3$, and subsequently separated apatites from heavier minerals (e.g. zircon, rutile, and monazite) using a heavy liquid with a density of 3.3 g/cm$^3$. A magnetic separator was used to further concentrate apatites. Apatites were then poured onto glass slides, carefully avoiding any potential selection of grains due to differences in size and shape. The grains were subsequently embedded in cold epoxy and polished to expose the internal surfaces of the apatite grains."*

***-I disagree that there is little evidence of erosion in the Northern Apennines before 10 Ma ago. For example, major unconformities are recorded within the wedge-top Apenninic successions in the Burdigalian (c. 18 Ma). This should be considered in the model set up.***

Within the wedge-top Apenninic successions, a major erosional unconformity at the top of an Aquitanian-lower Burdigalian formation has been attributed to an important thrusting phase (Papani et al., 1987). However, this is followed by shelf deposits in the wedge-top basin, rather than by the deposition of thick siliciclastic wedges of Apenninic provenance (Papani et al. 1987; Mancini et al. 2006). This pattern of deposition reflects a shallowing trend of the Epiligurian basin and rules out the emergence of the entire Apenninic accretionary wedge. Papani et al. (1987) suggest this unconformity and later ones can also be partly explained by sea level oscillations. We believe that these unconformities do not represent an onset of regional exhumation, which is the time period in Apenninic history that we are modeling. Other lines of evidence about the emergence above sea level of the Apenninic wedge come from many petrographic studies (e.g., Valloni et al., 2002) on the foredeep sandstones, indicating increasing Apenninic supplies through the middle Miocene. However, these studies find a clear shift to dominant Apenninic provenance only at the end of the Miocene, and the first important clastic wedge with Apenninnic provenance in Serravalle at ~12 Ma. In our manuscript, we have noted that some ages older than 12 Ma exist, but that it would proportionally decrease all erosion rates in our analysis. We add text to the manuscript Section 4.2 to this effect and to address the Reviewer's point.

Lines 458-466. *"An erosional unconformity (ca. 18 Ma) is recorded in the Epiligurian deposits, which has been attributed to a phase of major thrusting and sea level oscillations (Papani et al., 1987). This unconformity is succeeded by shelf deposits that record an overall shallowing trend in the Epiligurian basins and is thus not related to the emergence of the entire Apennines wedge, which is the time period in Apenninic history that we are modelling. In fact, stratigraphic and petrographic data indicate that the Northern Apennines increasingly provided detrital sediment to the foredeep through the middle-late Miocene, while the wedge was still submerged (Valloni et al., 2002). The first important clastic supply from the Northern Apennines date to the Serravallian at ~12 Ma (Caprara et al., 1985). Thus, in our erosion rate analysis we used an onset time of 10 Ma as a reflection of the onset of heat advection due to erosion."*

Our kinematic model does not include a parameter for the onset of erosion age. Since we incorporate erosion rates consistent with our analysis of AHe ages, this model should reflect the more recent <5 Ma evolution of the Northern Apennines, when the Northern Apennines experienced major uplift and erosional exhumation (i.e. early Pliocene). We add a statement to this effect in the discussion.

Lines 569-572. *"Since we constrain the range of possible prowedge and retrowedge erosional velocities from AHe erosion rates, the kinematic model can be assumed to reflect the more recent <5 Ma evolution of the Northern Apennines, when the Northern Apennines experienced major uplift and erosional exhumation (i.e. early Pliocene)."*

***-The amount of strike slip through time is explicitly plotted in Malusà, Faccenna et al 2015, their Fig. 10b, and should be considered in the model.***

In Malusa et al. (2015), the authors suggest that strike-slip motion in the Northern Apennines has exceeded 300 km over the last 35 Ma and that strike-slip motion is on the order of ~ 50 km in the last 10 Ma (Figure 10b). This strike-slip motion is attributed to lateral translation of the Adria Slab beneath the Alpine Wedge that began in the Eocene.

Our kinematic model is 1D, and can be considered as a cross-section through the Apennines. The kinematics are only considered within the Apenninic wedge itself. The Adriatic slab is incorporated into the model only in the sense that it contributes underplating material to the wedge and for the slab rollback velocity. Thus, this model cannot resolve alternate orientations of material into the wedge, or how the alternate orientations might change the velocity of material entering the wedge. We have added text to the Methods (Lines 264-265) and to the Discussion to further emphasize that the model is 1-D, and that it only considers a flux of material and slab rollback velocity in the direction of the wedge (i.e. perpendicular to the strike of the orogen).

Lines 285-286. *"Since the model represents a 1D cross-section through the Northern Apennines, all velocities and rates specified in this model are assumed to reflect motion within the direction of the wedge (i.e. perpendicular to the strike of the orogen)."*

Lines 617-620. *"We allow for a range of rollback rates that are consistent with rates for the field area, although the kinematic model is not able to resolve variability in rollback rates in either space or time, nor can it resolve how rotation or motion external to the wedge (e.g. lateral translation of the Adriatic slab relative to the Apennines wedge) would alter the flux or orientation of material entering the wedge."*

***-If the high rate of slab rollback does not produce a realistic pattern of cooling ages across the orogen, this does not necessarily imply that the model is right, and the slab rollback rates are wrong. The authors should address this point in a more open way.***

In Methods (Line 260) and Discussion (see below), we have added text to acknowledge that other studies have found higher rates of slab rollback for the Northern Apennines during the last 10 Ma. We note that a much higher rate of slab rollback would significantly affect the maximum burial depths for the particle paths, such that the model would produce shallower maximum burial depths (<2 km at the drainage divide and <3 km at the retrowedge model boundary) than values constrained from vitrinite reflectance. Thus, a lower rate of slab rollback on the order of 9-10 km/My will produce both the pattern of cooling ages and maximum burial depths in the Northern Apennines.

Lines 580-583. *"Slab rollback rates vary over an order of magnitude in the Northern Apennines (6–20 km/My). Higher values of slab rollback can reproduce the pattern of cooling ages across the Northern Apennines, although predicted maximum burial depths decrease with higher slab rollback rates."*