We would like to thank anonymous referee #2 for his/her comments which have helped to clarify the paper. Our response to the comments is given below:

1) **Determination of MTT:** We have added the following sentence and paragraph for better explanation of the tritium dating method:

   Page 4735 line 1:
   … streamwater dating. Tritium, with its half-life of 12.32 years and characteristic pulse-shaped input from nuclear weapons testing six decades ago, can be used for dating water with mean transit times ranging from one year to several hundred years. …

   Page 4736 line 25:

   Tritium dating of ground- and streamwater in the Southern Hemisphere now relies on the measured radioactive decay of cosmogenic ^{3}H occurring in the groundwater system that feeds the stream baseflow. The groundwater dating method is described in section 4. Relying on the radioactive decay, ^{3}H dating of streamwater in the Southern Hemisphere is now possible using a single ^{3}H measurement for each individual flow rate, allowing relatively easy measurement of mean transit times across a range of flow rates.
   In the Northern Hemisphere, ^{3}H dating of streamwater still requires comparison of the measured ^{3}H concentration in the baseflow groundwater discharge to the ^{3}H pulse from the atmospheric nuclear weapons testing period because ^{3}H concentrations are still affected by the tail-end of the bomb pulse. Therefore, several ^{3}H measurements in the stream are still necessary to overcome ambiguous interpretations. Mean transit times for various flow scenarios can also be determined in the Northern Hemisphere already if several ^{3}H measurements are available at each flow scenario (e.g. summer low-flow, summer baseflow, winter baseflow).

2) **Non-stationary Transit Time Distribution**: We have added the following sentence for better clarification on Page 4741 line 25:

   Current catchment models commonly use stationary transfer functions, with a constant transit time distribution (TTD) in the water exiting the catchment. However, the tritium data in the Toenepi Stream show clearly that the TTD can change significantly with flow. This demonstrates the need to develop new catchment models that account for dynamic TTDs. Tritium will be a useful tracer to calibrate such models for catchments with significant components of water older than 2 years.

3) **Figure 2:** We have clarified the figure caption. Yes, such a figure can be used as a look-up figure to determine the age of streamwater, but it would need to be generated for the specific TF of the catchment (here EPM with 80% EM), for the specific input (here Kaitoke and Vienna), and for the specific year of output (here 2010 and 2020).

   Figure 2. Tritium output for a typical transfer function of 80% exponential flow within an exponential piston flow model for the Kaitoke (New Zealand)

and Vienna (Europe) tritium inputs. Solid lines are current tritium outputs for the year 2010. The predicted output for Kaitoke for 2020 (dashed line) is shown for comparison.

4) **Weighting of the input function:** We thank the referee for highlighting this mistake. We have corrected this as outlined in the response to referee#1.

5) **Title:** We agree with the referee and have changed the title to: Dating of stream water using tritium in a post nuclear bomb pulse world: continuous variation of mean transit time with streamflow.

6) **Figure 5:** We agree with the referee. Instead of connecting the points with a full line, we use a very fine dotted line. We retained the dotted line to make visible the similar pattern between streamflow, -SiO_2, and TU.