Dear Editor,

We are very thankful for the fast and very constructive review, which lead to many improvements of the manuscript.

We agree that the relationship between ring width and wood density follows a non-linear trend.

The model of wood-density retained after comparison and fit using both likelihood and Bayesian methods was the model 3 with the form

$$WD_{ij} = a_0 + a_1RW_{ij}^{a_2} + \frac{a_3}{DBH_{ij}^{a_4}}.$$  

It consists in a power function of both ring width and diameter, therefore is a nonlinear model. As presented in the figure enclosed, it fits well the experimental data.

There were no assumptions of linearity in the relationship between wood density and ring width and diameter. The form of the models tested followed those frequently used in wood density modeling studies (e.g. Bergqvist 1998, Franceschini et al., 2010; 2013), as also mentioned in the manuscript (§2.2.1). Thus, the model used in the MCMC was not linear. The confusion came from the fact that, in a previous version of the manuscript, the decrease in wood density along the ring width increase was described in the text (§3.1) using a rate (kg.m$^{-3}$ mm$^{-1}$), despite the use of nonlinear equations in both the likelihood (§3.2) and the Bayesian modeling (§3.3 and further). The use of a rate was meant to provide a simple value, easy to retain, but was indeed based on a linear assumption. Since it introduced confusion, as underlined by the reviewers, it was dropped.

We believe that there are no more possibilities for confusion since no reference to a rate or any linear model remained in the text.

Yours sincerely,

Olivier Bouriaud
Fig. 1. Relation between annual wood density and ring width. Red dots represent the model fit.