

## Reply to reviewer 2

Many thanks for the comments of Reviewer 2. Please find here below my reply in black.

[palaeoclimatology and a corrective to misreadings of his climatological investigations.](#)

I understand your concern about climate models, GCMs in particular. I agree with you that “These points could be considered in a more theoretical paper at some other time, and I do not think that this would be a place to resolve the questions.” I hope that somebody will once write a nice history of modeling the global warming using in particular and mainly GCMs.

About Milankovitch, the reason why I think he deserves this title of “father of paleoclimate modeling” is because I have not found any scientist before him coming with so many papers stressing a mathematical climate and incoming solar radiation. He has written about 100 papers (most of them have more than 20 pages in Serbo-Croatian/Cyrillic, German, or French) as a single author which is totally different from the GCMs papers where there are so many authors that it becomes difficult to see their original individual contributions. His mathematical climate and his caloric incoming solar radiation are fully original, as well as his dating and interpretation of the paleoclimate data. To cite only his most well known 1941 book, besides 8 chapters on fundamental celestial mechanics (150 pages) and 4 on polar wandering (61 pages), there are 3 chapters (80 pages) on Terrestrial insolation, 3 (70 pages) on connection between insolation and atmospheric temperature (his mathematical climate), 5 (117 pages) on Ice ages, mechanisms and chronology. This is about 270 pages on what I call paleoclimate modelling; moreover, it was written in the first part of the 20<sup>th</sup> century, about 100 years ago. His work had a profound influence on the geologists and geophysicists of these early times (Penck, Brückner, Köppen and Wegener in particular) and continue to have one since the revival by Hays, Imbrie, Shackleton and Berger. The early part of the 20<sup>th</sup> century saw two exceptional geophysicists: Wegener (the father of continental drift, EOS-Transactions of AGU, vol 68 issue 19, p 516 by T.S. Ledley) and Milankovitch. Not only they worked together, but also both of them “had the imagination to bridge the confines of one discipline to make a major contribution to another.”

Finally, I would like to stress that I suggest to call Milankovitch the “Father of PALEOLIMATE modeling”. This a subject which is more related to astronomy (a forcing) than to CO<sub>2</sub> (a feedback). I therefore do not think that I do injustice to scientists like Arrhenius and others for whom I have a great respect. If we analyze the history of the CO<sub>2</sub> problem, like I did for the astronomical theories, we have at least: Fourier, Callendar, Tyndall and Arrhenius to discuss. I have been invited to participate to the symposia in honor of Arrhenius and of Tyndall and it is indeed not easy to decide who did the most important first contribution about CO<sub>2</sub>. (the book on *Théorie de la Chaleur* (648 pages) by Fourier dates back 1822 and his paper on les "Températures du Globe terrestre" was published in 1824. The greenhouse effect by Tyndall dates back 1859, the year Arrhenius born and 37 years before the paper by Arrhenius). I wish a paper on the history of CO<sub>2</sub> will appear soon.