Response to Review-Report-Section-II-Ch-03-1

General Remarks and Observations

We know that that in viscoelasticity the fractional order introduces dissipation and proper creep and relaxation behavior. What is the physical process in the case of the epidemic equations? A sentence in the Introduction will be enough.

We added the following sentence

When fractional order derivatives are used in epidemic models, they modify the duration, peaks of infected and dead individuals per day and number of casualties in the population.

Indicate the end of the epidemic in the table.

The end of the epidemic is defined as the day in which the number of infected individuals is smaller than one. This date makes sense only for the classical SEIR model, for the fractional order SEIR model the date has no sense due to the extremely extended period of the epidemic predicted by the simulations.

For instance, when you report an incubation period of 3 in Table 1. This is actually the incubation period or the incubation period power ?. In all the tables you should give the real incubation period, e.g. $(\epsilon^{-1})^{\nu} = 3^{\nu}$ *. This 3 is correct. Do the same for all the other parameters. Then, in ALL the tables there is no need to indicate the power , only in the equations.*

The Table is fixed.

Conclusions section. Write one, even if short.

A new Section with Conclusiones in included

Minor points:

Abstract,

6th line: there are two the

Done

N_0 *is not defined and in validation has a different symbol.*

Done

Introduction

(page 2), First paragraph, 5th line: still increasing at July 15th: I assume that your are updating the data. This should change after the update.

This paragraph is fixed using the updated results

page 2 I see that you assume 100 infectious initially. What happens if you change this number?

We added the following paragraph at the end of subsection 4.2:

In the four cases described above we consider that the initial number of infected individuals is $I(0) = 100$. Nevertheless, we tested other values: if $I(0)$ belongs to the interval $[10, 150]$ a reasonable adjustment is obtained, with similar values to those shown in Table 2 and a slight delay on the infected individuals peak as $I(0)$ decreases. Out of this interval, the fitting is poor and the results have no physical meaning.

Last paragraph, last line: I think that dead individuals is dead individuals per day

Done

Section 2 The Caputo derivative and initial value problems *(page 3) first line: Replace* $D_c^\nu(u(t))$ *by* $D_c^\nu(u(t)$ *(remove parenthesis)*

Done

Eq. (2): Replace $D_c^\nu(f(t))|_{t_{n+1}}$ *by* $D_c^\nu(f(t)|_{t_{n+1}}$ *; these expressions have an additional parenthesis*

Done

Section 3 The classical and fractional-order SEIR models

(page 4) first line of Eq.(6): λ^ν *should be* $\mu^\nu N$ *;*

Eq.(7): μ^μ *should be* μ^ν*.*

Done

Subsection 4.1 Validation of the GMMP algorithm

(page 5) first paragraph, 2nd line: fractional orders $\nu = 1$*, 0.9 and 0.8 is* $\nu =$ *0.9 and 0.8?*

Yes, fixed

Section 5 Analysis of the COVID-19 epidemic in the RMBA

(page 9): As mentioned above, update the analysis using data at least up to July 31st. Therefore update all the dates.

All dates were updated, the analysis is done using data until September 22th, 2020 (Section 5 is now Subsection 4.2). Besides we added a new Case 4, considering 30% more casualties to date, taking into account that the reported number of deceased people could have been underestimated due to delays in the upload of official data.

Moreover, the authors should include an analysis of variations in the results associated with changes in the initial number of infected individuals;

As indicated in the **General Remarks and Observations** a paragraph is included at the end of Subsection 4.2

(page 10) 3rd paragraph, line 3: Complete the sentence shows a decay of the in the simulated curves;

Done

(page 14) last sentence, fix and the peak infected individuals and number of casualties increase

Done

6 Appendix

(page 16) All lines of Eq.(13): $b_{j,n+1)}$ *by* $b_{j,n+1}$

Done

(page 17) All lines of Eq.(14): $f_j^\nu(S_{n+1}^p, E_{n+1}^p, I_{n+1}^p, R_{n+1}^p)))$*; there are additional parenthesis.*

Done

(page 17): Update reference [2]

Done