Report on the paper

"ON CONTRACTION PRINCIPLE APPLIED TO NONLINEAR SEQUENTIAL FDE WITH DERIVATIVES OF ORDER $\alpha \in (0;1)$

JM100

by Małgorzata Klimek

The aim of the paper under review is to prove some existence and uniqueness theorems for the one-term and multi-term fractional differential equations dependent on the left-sided derivative of given order $\alpha \in (0;1)$. The Bielecki method of equivalent norms is extended from ODE's to fractional differential equations by application of the two-parameter Mittag-Leffer functions in construction of new norms.

The idea of renorming of spaces, which is well-known for ODE's was also used in the theory of fractional differential equations. At the best of my knowledge, it was introduced in [22] and in my opinion, this should be stressed in the paper. This is an interesting idea developed by the Author and this novelty should be explicitly stated in the paper (in the "Introduction").

In the whole paper the "sequential" concept of fractional derivatives is announced, but there is no definition and/or explanations. Even in the title the word "sequential" is used, so it should be important. Nevertheless, I don't find in the paper the sequential derivatives in the sense of Miller and Ross, Podlubny or Chikrii. I know, that there is a close connection between usual and sequential definitions. Moreover, the problem described in the paper is related to the sequential one, but the paper should be clear for **all** readers. Some definitions and comments are absolutely necessary (cf. [18]).

I don't like the abbreviation FDE for "fractional differential equations". This has usually another, much older, meaning ("functional"). In particular, the title is not acceptable for me. But this is only my opinion.

One of the "hidden" restrictions in the paper is the assumption about α and β. In my opinion, it follows from the proof but seems to be artificial ("small" β). It will be interesting how to describe the critical values of these constants.

I have also a small objection to the style of the References (bad abbreviations of journals, lack of accents in [20], for instance).

The paper is correct, interesting and has a number of interested readers, so I can recommend the paper for publication. Nevertheless, in my opinion, at least a part of the above remarks should be taken into account in the final version.