**Response to reviewers**

Reviewer(s)' Comments to Author:

**Reviewer 1:** This paper has proposed a new method for design of the first order differentiator obtained by parallel connection of direct path and IIR all-pass filter.

1. The suggested solution provides lower magnitude relative error than several known differentiators. However, other contributions of proposed solution are questionable. Phase error, as well as average deviation in time domain, are lower in Goswami and Al Aloui differentiators. All considered differentiators structures including proposed one use two multipliers.

Response:

1. The authors have to be more precise when using some terms. For example, in Abstract: “Described method allows obtaining solution with minimum mean relative error at desired region”.

Response: *An effort is made to further clarify statements through the manuscript. Mentioned sentence from Abstract is rewritten as: “Described design method allows one to obtain solution with minimum mean relative error at desired region by controlling the ratio of phase response extremas”.*

1. Small relative error at low frequencies is condition for good time domain behaviour.” – magnitude or phase error? Similar can be found in the other parts of the text.

Response: *Corrected. Both magnitude and phase errors should be sufficiently small.*

1. There are several typos for “equiripple” (equripple, equirriple…).

Response: *Corrected*.

1. What is “OU differentiator”?

Response: *OU differentiator is actually Goswami et. all. differentiator [2], and corresponding text is corrected.*

1. Caption of the Fig. 13 is inadequate.

Response: *Corrected*.

1. Explanation about number of multipliers (below Table 9) is a bit confusing, it needs to be rewritten.

Response: *Explanation about required number of multiplications is rewritten as: “In general, transfer function of first order IIR filter requires three multipliers. However, it is well known that all-pass filters, being a special case of IIR filters as numerator and denominator polynomials are mirror image polynomials, can be realized with reduced number of multiplications which is equal to the filter order. Hence, proposed filter order differentiators require only two multipliers”.*

**Reviewer 2:** My recommendation is that the reference list should be enriched with a recent article from the journal Automatic control and Robotics. Also, my recommendation is to remove reference number 11. because it is out of date (more than 15 years old).

Response: *Corrected*.