Simon Popecki:

The experiments performed with these first and second order circuits show a very low deviance between theoretical and expected values. It is worth noting that with mechanical systems, it takes a considerably higher degree of effort to yield the same results. This is largely in part due to the consistency and predictability of electronics, which have become far more standardized than mechanical systems. For the first order system, theoretical and actual values regarding step response were within a few percent difference – so close in fact, that measurement resolution/sampling rate becomes a question with experimental results.

Differences in experimental and theoretical results of the second order response to a step input clearly show that there were not enough data – on page 17, it is especially evident in the phase angle plot that data are missing, as discrete points which lie in areas predicted by calculation form lines cutting through the phase change. As far as the individual points are concerned, there is no prominent difference between the theoretical results and experimental results.

However, when determining the broadband frequency response to noise, the predicted values were clearly different than the experimental values recorded in LabView. Error in this operation was considerably high – up to 84%. This could have been caused by a multitude of factors, if the issue is of the hardware variety likely the input was the primary problem. Also likely, is poor data acquisition – an extreme amount of noise was collected on the LabView samples, possibly contributing to error.