IV. Conclusion

The idea behind this article is that it is possible to make MVL circuits capable of performing the same functions available to digital circuits. This article shows the operation of circuits that adopt the same representation system as traditional binary digital circuits. However, other techniques could be used to store MVL values, such as the resistance value of a memristor [18], [19]. In fact, since a MVL function is a mathematical application that leads from a set of discrete domains to the same discrete domain, we can assimilate a MVL function to a memory. The input variables act as indices of the memory location in which we find the expected output.

A multi-value memory can be easily realized using arrays of memristors. These devices are widely used in interconnected grids to quickly perform matrix calculations, exploiting their ability to set their resistance within certain values. This is an example of using the resistance of a passive element to store a discrete value. However, with new materials and nanotechnology, nothing prohibits us from associating a multi-value quantity with a physical entity different from the electrical potential in the future [20].

The main shortcoming is the settling time, which would limit the operating frequency of the summing circuit. If this research is to be followed up with an industrial approach, the circuits will have to be engineered to reduce the settling time and increase the operating frequency. The other aspect that is considered important in this research is the scalability of the solution. All the theory described makes no assumptions about the number of levels used. So, the approach remains valid regardless of the base adopted. For reasons of backward compatibility and in order to make these new circuits immediately integrable with current systems, it is desirable to use bases that are powers of two. The upcoming research is subject to build new circuit apparatus that can be used within a complete computing architecture entirely in MVL logic.

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