

Towards true magnonic NAND gates

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The XXI century renaissance of magnonics was fuelled by promises of using spin waves in data processing. Several designs of magnonic logic gates were proposed. Yet, most of them were linear devices, and the crosstalk between the output's amplitude and phase was typically neglected. So, logic gates demonstrated to date could not be concatenated into more complex logic architectures. Here, we will describe and evaluate performance of true magnonic NAND gates based on magnonic resonators [1-3] that show a strong nonlinear response in spin wave transmission [4]. The gates use amplitude encoding, and the amplitude and phase of their outputs are within the tolerances imposed on their inputs, which means the gates can be concatenated into more complex logic circuits.

The research leading to these results has received funding from the UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee (Grant No. 10039217) and from the Horizon Europe (HORIZON-CL4-2021-DIGITAL-EMERGING-01) under Grant Agreement No. 101070347. Yet, views and opinions expressed are those of the authors only and do not necessarily reflect those of the EU, and the EU cannot be held responsible for them.

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