High resistive switching in CuMnAs and optimization of the material

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Antiferromagnetic CuMnAs has attracted a significant attention since the demonstration of the possibility to control its magnetic ordering by electrical current. In a more recent study, it was shown that an additional and distinct mechanism present in CuMnAs can be used to achieve high resistive unipolar electrical, and optical switching at femtosecond speeds. This new discovery was enabled by optimization of CuMnAs growth via molecular beam epitaxy. Yet, more in-depth material studies are required for full understanding of this new switching phenomenon. We will show how the basic material parameters correlate with the performance of CuMnAs devices and how its complex crystalline structure could be related to the physics involved in the switching experiments.