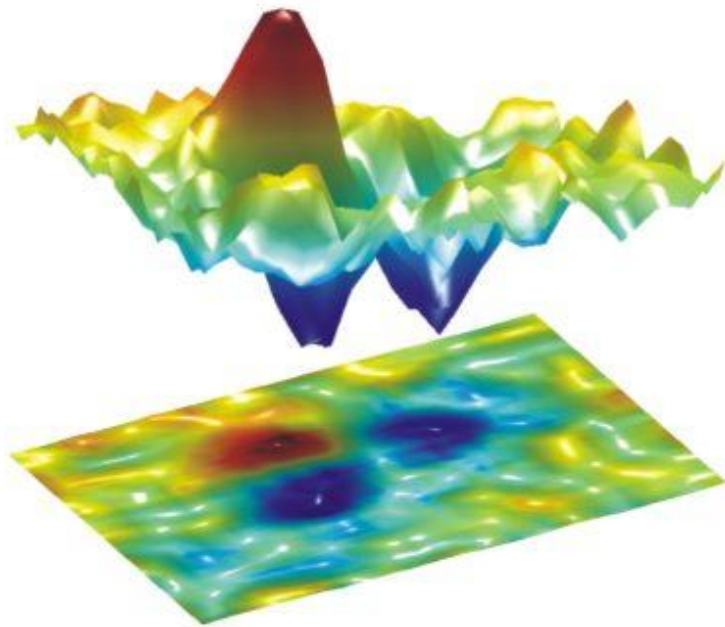


## On the life and death of magnetic vortex structures

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In this talk I will review some recent advances in Vortex dynamics. In collaboration with the MPI Stuttgart group we have studied various aspects of vortex dynamics using the detection method of time resolved X-ray magnetic circular on very small length scales (below 30 nm).

In our recent work we have demonstrated vortex core switching [1], unidirectional vortex core switching using rotating magnetic fields [2], and very recently unidirectional vortex core switching using GHz field excitations [3]. The latter experiments bring vortex dynamics into a new frequency range.

Various other experiments have added valuable information for the understanding of the reversal mechanisms in flux closed confined magnetic structures using magnetic fields [4].

- [1] B. Van Waeyenberge et al., *Nature* **444**, 461 (2006)
- [2] M. Curcic et al., *Phys. Rev. Lett.* **101**, 197204 (2008)
- [3] M. Kammerer et al., *Nature Communications* **2**, 279 (2011)
- [4] A. Vansteenkiste et al., *Nature Physics* **5**, 332 (2009)