

Practical on domain walls

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This hands-on practical on magnetic domain walls intends to handle basic analytical considerations about domain walls. The tutorial consists of a series of focused steps on which the students are required to work, then providing a solution to the black board to the entire audience.

Topics:

1. Handwaving approach
 - a. Dimensional analysis
 - b. Variational model
2. Functional minimization
 - a. The Euler-Lagrange equation
 - b. Application to magnetism and Brown boundary conditions
3. Description of domain walls
 - a. Domain wall profile
 - b. Wall width and energy

Recommended reading:

- [1] F. BLOCH, Zur Theorie der Austauschprobleme und der Remanenzerscheinung der Ferromagnetika, *Z. Phys.* **74**, 295 (1932).
- [2] O. Fruchart, lecture notes in nanomagnetism, <http://fruchart.eu/olivier/lectures/nanomagnetism-2018-09-17.pdf>