Minimization of Ohmic losses for domain wall motion in ferromagnetic nanowires[1] ARTEM ABANOV, OLEG TRETIAKOV, YANG LIU, Texas A&M University — We study current-induced domain-wall motion in a narrow ferromagnetic wire. We propose a way to move domain walls with a resonant time-dependent current which dramatically decreases the Ohmic losses in the wire and allows driving of the domain wall with higher speed without burning the wire. For any domain wall velocity we find the time-dependence of the current needed to minimize the Ohmic losses. Below a critical domain-wall velocity specified by the parameters of the wire the minimal Ohmic losses are achieved by dc current. Furthermore, we identify the wire parameters for which the losses reduction from its dc value is the most dramatic.

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