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\Analytic theory for the switch from Bloch to Néel domain wall in rectangular nanowires with perpendicular anisotropy\[1] MIRIAM DEJONG, KAREN LIVESEY, University of Colorado Colorado Springs — h *pardabstract−*\Domain walls in rectangular magnetic nanowires have been proposed for a variety of important applications, including use in logic schemes, data storage and bio-sensing. It is known that at the precise geometry where the switch between Bloch and Néel domain walls occurs, the walls can be moved through a nanowire with the least amount of energy. For a constant wire thickness, reducing the wire width leads to a switch from the lowest energy domain wall being of Bloch-type to it being of Néel-type. This switch occurs due to competing energy contributions in the domain wall types, with the demagnetizing energy being the most influential. Through an iterative process we have found analytic energies that can easily be plotted to determine the precise geometry where the switch from one wall type to another occurs. Our results agree well with micromagnetic simulations and experiment and it is therefore expected that the analytic expressions provided here will be useful to experimentalists aiming to make nanowires for low-power applications.\-/abstract-\pard

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