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Triplet Andreev reflection off a domain wall in a lateral geometry
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Dahlem Center for Complex Quantum Systems, Freie Universitaet Berlin — We find
that geometry is an important ingredient in modeling the triplet Andreev reflection
amplitude at the interface between a half-metal and an s-wave superconductor. Consid-
ering a domain wall as a source of spin-rotation symmetry breaking we find that
while in a serial geometry the Andreev reflection amplitude vanishes at the Fermi
energy, it remains finite if the contact is made in a lateral fashion. In addition, if the
half metal is a thin film, rather than an extended magnet, the amplitude is enhanced
by a factor $l_d/d$, where $l_d$ is the width of the domain wall and $d$ the film thickness.
We conclude that in a lateral geometry, domain walls can be an effective source of
the triplet proximity effect.

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