

## Does the Aharonov-Bohm effect occur?

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**Abstract** Aharonov and Bohm (1959) showed that, far from being merely a mathematical tool, the vector potential  $A$  can have a microphysical effect even when irrotational, in which case the magnetic field is null. Still, at first sight there is something weird about this situation. Do we have to admit a new force? I argue that there is no paradox in the potentials-formulation of electrodynamics, for it shows that, while " $\text{curl } A = 0$ " represents a vanishing magnetic field,  $A$  alters the motion of charged matter dragged by the electric field. And a semantic analysis of the potentials formulation of electrodynamics shows from the start that this theory refers to e.m. fields.