

## **Hall Effect and the problem of "hidden momentum"**

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It is a generally accepted fact that electromagnetic field carries energy and momentum. If it interacts with a material system, momentum originally stored in the field may be partially converted into ordinary mechanical momentum of the ponderable system. While for quickly oscillating electromagnetic fields such a conversion of electromagnetic momentum into mechanical one was made clear by numerous theoretical studies and confirmed by convincing experimental evidence of the light pressure, for the case of purely static electromagnetic fields is the situation quite different. Since it is very difficult in this case to localize the converted momentum of non-electromagnetic nature within the material system, the term "hidden momentum" is traditionally used. Moreover, the effect is as a rule very subtle, of order of  $\sim 1/c^2$ , so that till now it has been studied only theoretically and has never been demonstrated experimentally. However, in this contribution we will show, that ordinary Hall Effect devices represent material systems where the momentum balance between static electromagnetic field and electronic subsystem is relatively easy to treat, both theoretically and experimentally. This circumstance may be helpful for resolution of controversies related to the momentum of static electromagnetic fields.