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TITLE: Vacuum effects in strong magnetic fields are signatures of high-energy physics

ABSTRACT:
We review several models which predict observable effects, similar to those, expected for axion-like particles. All these models are low-energy effective theories resulting from non-trivial anomaly cancellation between low energy and high energy sectors of in some more fundamental model. One of these models contains vector boson, coupled to the photon and provides a way to reconcile the results of PVLAS experiment with astrophysical bounds on axion-like particles. Other models do not contain any extra light particles but still predict vacuum birefringence and other non-trivial effects in strong magnetic fields.