

UCLA NUCLEAR PHYSICS SEMINAR

Spin polarization of gauge bosons in rotating plasma

Presented by: Andrey Sadofyev
Los Alamos National Laboratory

I will show that the chiral vortical effect (CVE) known to take place for massless fermions in a rotating system can be, in fact, generalized to particles of arbitrary spin. These effects are particularly interesting since they describe the polarization of quarks, gluons, and photons in rotating QGP produced in heavy-ion collisions. For gauge bosons the local polarization current is not gauge invariant making it harder to use this object on practice. This issue can be resolved if one focuses on a class of gauge-invariant but non-canonical polarization currents of gauge bosons known as zilches. I will further show that CVE for gauge bosons has a counterpart in the general zilch current - zilch vortical effect (ZVE) and discuss how ZVE arises in a simple theoretical setup.

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