

# The 7th International Conference on Chirality, Vorticity and Magnetic Field in Heavy Ion Collisions



Contribution ID: 52

Type: **not specified**

## Photon polarization in the vorticity and magnetic field

It is believed that strong vorticity and magnetic field are produced at an early stage of heavy ion collisions. Photon polarization offers a valuable probe of these fields. The vorticity field induces an anti-symmetric component of virtual photon self-energy [1], which gives rise to a helical rate counting a weighted difference between right-handed and left-handed lepton pairs [2]. On the other hand, in a strong background magnetic field, the photon self-energy has an anti-symmetric component [3] which leads to the splitting of a real photon into one time-like and one spacelike modes in a charged plasma. The polarizations of these modes induce polarization rotation of probe fermions, which can be accessible experimentally through vector current in early stage of heavy ion collisions

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