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Anomalous Faraday rotation in the ISM/ICM[1] MIKHAIL V. MEDVEDEV, University of Kansas — Faraday effect is a common and useful way to deduce cosmic magnetic fields in the interstellar and intracluster media (ISM and ICM). Faraday rotation is the result of magnetically-induced birefringence in a dielectric medium causing a linearly polarized wave to suffer a rotation of its polarization axis as it traverses such a medium. However, the standard λ^2-law of the rotation angle may not hold in strongly turbulent plasmas. Electromagnetic high-frequency and/or small-scale fluctuations may lead to effective collisionality with the pitch-angle diffusion coefficient being an effective "quasi-collision" frequency. Recently, we showed that quasi-collisionality may radically alter radiative transport properties of plasmas, such as absorption, transmission and reflection and other effects, which can be very important in laboratory and astrophysical plasmas. Here we briefly discuss the quasi-collisional generalization of the classical Faraday effect, which is drastically modified and can even become negative. Furthermore, we explore the origin of the long-known anomaly of Faraday rotation in a famous Cygnus regions. We argue that the anomaly can be due to the anomalous Faraday rotation in a thin "blanket" of turbulent plasma at the front of an interstellar bubble/shock.

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