Plasma Diagnostics Relevant for COMB

Naveen Pathak

On Behalf of L. A. Gizzi

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Motivation

- Probing the interaction region to identify the best conditions for specific applications (interaction is sensitive to laser and plasma parameters).
- External control on the interaction mechanism by optimizing the electron density. For example, electron density optimization by varying the gas pressure.
- Basic information of the interaction region in terms of scattering and coupling of the light in the medium i.e. Plasma.

Faraday Rotation

- The Faraday effect causes a rotation of the plane of polarization which is linearly proportional to the component of the magnetic field in the direction of propagation.
- The Faraday effect causes left and right circularly polarized waves to propagate at slightly different speeds, a property known as circular birefringence. Since a linear polarization can be decomposed into two circularly polarized rays, the effect of a phase shift between them, induced by the Faraday effect, is to rotate the axis of that wave's polarization.