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Isochoric Plasma Sources for Laser-Plasma Interaction Studies[1]
MICHAEL J. HAY, ERNEST J. VALEO, NATHANIEL J. FISCH, Princeton Plasma Physics Laboratory — The resonant backward Raman compression of intense laser light in plasma requires a high-density plasma that is easily accessed by light. Gas jet technology is at its limit: either in density, so new technology is necessary to process shorter wavelength light; or in geometrical size, so new technology is necessary to process substantial powers at large aperture. However, aerogel or dense aerosol targets may overcome the limitations of gas jets. We present scaling relations that define the operating parameter space for compression using silica aerogels. Using Ansys Fluent we simulate dense aerosol formation under aerodynamic focusing. These simulations include momentum coupling between the carrier gas and the particles' virtual flow field.

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Michael J. Hay
Princeton Plasma Physics Laboratory

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