Abstract Submitted
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Ionization effects and modeling considerations for sudden viscous dissipation in compressing plasma turbulence[1] SETH DAVIDOVITS, Princeton University, NAT FISCH, Princeton Plasma Physics Laboratory — Turbulent plasma flow, amplified by rapid 3D compression, can be suddenly dissipated under continuing compression.[2] This sudden dissipation comes about because the plasma viscosity is very sensitive to temperature, $\mu \sim T^{5/2}$. We discuss approaches to constructing simple models to capture the turbulence energy growth and dissipation during rapid plasma compressions. Additionally, we explore the effects on compressing turbulence of plasma ionization during compression, to which the viscosity is also very sensitive. We show plasma ionization during compression enables larger turbulence growth, compared to when there is no plasma ionization. Further, ionization during compression can prevent the sudden dissipation effect, and can also make the difference between increasing and decreasing turbulence energy under compression. The influence exerted by ionization opens up the prospect for control of turbulence growth and sudden dissipation timing through choice of the plasma ion species.

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[2]S. Davidovits and N. J. Fisch PRL **116**, 105004 (2016)

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