Direct Numerical Simulation of the Thermal Effects of Plasmas on Turbulent Flows.[1] SHANKAR GHOSH, KRISHNAN MAHESH, University of Minnesota — The thermal effects of plasmas on isotropic turbulence are studied using direct numerical simulations. The turbulence is assumed to be spatially homogeneous and isotropic prior to generation of the plasma. Two idealizations of the plasma are considered - spherical and conical. The spherical idealization represents a point plasma. The conical idealization approximates the tear-drop shape of the plasma region that is observed experimentally. The plasma generates a blast wave which produces a toroidal region of vorticity for the tear-drop idealization. The variation of the magnitude of vorticity with temperature ratio and size of the plasma region is examined. The shock wave gets distorted as it interacts with the background turbulence. The turbulence is seen to be suppressed in the region occupied by the plasma and slightly amplifies across the blast wave. Details will be discussed.

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