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Pressure anisotropy induced by velocity shear DANIELE DEL SARTO, Université de Lorraine, France, FRANCESCO PEGORARO, FRANCESCO CALIFANO, Pisa University, Italy — In a collisionless magnetized plasma a sheared velocity field may lead to the anisotropization of an initial Maxwellian state. By including the full pressure tensor dynamics in a fluid plasma model, we show, analytically and numerically, that a sheared velocity field makes an initial isotropic state anisotropic and non-gyrotropic, i.e., makes the plasma pressure tensor anisotropic also in the plane perpendicular to the magnetic field. The propagation of transverse magneto-elastic waves in the anisotropic plasma affects the process of formation of a non-gyrotropic pressure and can lead to its spatial filamentation [1]. This plasma dynamics implies in particular that isotropic MHD equilibria cease to be equilibria in presence of a stationary sheared flow. Similarly, in the case of turbulence, where small-scale spatial inhomogeneities are naturally developed during the direct cascade, we may expect that isotropic turbulent states are not likely to exist whenever a full pressure tensor evolution is accounted for.

[1] D. Del Sarto, *et al.*. arXiv:1507.04895 (2015)

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