REGULARIZATION ESTIMATES AND HYDRODYNAMICAL LIMIT FOR THE LANDAU EQUATION.

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ABSTRACT. In this talk, we study the Landau equation under the Navier-Stokes scaling in the torus for hard and moderately soft potentials. More precisely, we investigate the Cauchy theory in a perturbative framework and establish some new short time regularization estimates for our rescaled nonlinear Landau equation. These estimates are quantified in time and we obtain the instantaneous expected anisotropic gain of regularity. Moreover, the estimates giving the gain of regularity in the velocity variable are uniform in the Knudsen number. Intertwining these new estimates on the Landau equation with estimates on the Navier-Stokes-Fourier system, we are then able to obtain a result of strong convergence towards this fluid system. This is a joint work with Kleber Carrapatoso and Isabelle Tristani.