Statistical Hydrodynamics and Reynolds averaging

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We shall revisit the Reynolds method of averaging to obtain equations for turbulent flow in the spirit of M.I. Vishik and A.V. Fursikov's approach to statistical hydrodynamics. In particular, for statistically homogeneous flows we shall examine how space averages over domains (as in the original Reynolds ideas) are close to statistical averages on a phase space of vector fields.

We shall also examine Reynolds averages obtained from microscopic statistical mechanics at a hydrodynamic limit via measure disintegration.

References

[1] Dostoglou, S. *Statistical mechanics for fluid flows.* Spectral and Evolution Problems vol. **20**; Proceedings of the 20th Crimean School & Conference, 193-198, 2010.

[2] Dostoglou, S. *On Hydrodynamic equations from Hamiltonian dynamics and Reynolds averaging.* Submitted.