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The purpose of this article is to consider possible applications of Topological Geometrodynamics (TGD) to hydrodynamics. The basic question is what quantum hydrodynamics could mean in the TGD framework.

Hydrodynamical turbulence represents one of the unsolved problems of physics and therefore as an excellent test bench for the TGD based vision. How turbulence is generated and how it decays? What is the role of vortices and their reconnections? These are the basic questions. The central notion of the TGD based model is that of a magnetic body (MB) carrying dark $h_{eff} = nh_0$ phases and controlling ordinary matter. Z^0 magnetic field is proportional to the circulation in the proposed model and electroweak symmetry restoration below scaled up weak Compton length is in an essential role. This picture is applied to several problems including also the problems related to the magnetic reconnection rate and to the survival of magnetic fields in even cosmic scales. Monopole flux tubes provide the solution here.

The hydrodynamic quantum analogs is a fascinating field and TGD picture is applied to this case. The basic prediction is that the Faraday wave length playing the role of Compton wavelength corresponds to the gravitational Compton length predicted by the generalization of the Nottale hypothesis. The value is very near to the minimal value predicted by TGD.

In the TGD framework it might be possible to understand viscosity in terms of dark angular momentum unit $\hbar_{eff}$. A proposal which allows us to understand the critical values of Reynolds numbers for the generation of turbulence in terms of the gravitational Compton lengths associated with Sun and Earth is made. Also this success supports the view that new quantum theory provided by TGD is needed in order to understand the generation of turbulence.