Contribution Title:	NAVIER-STOKES EQUATIONS AND FORWARD-BACKWARD SDES ON THE GROUP OF DIFFEOMORPHISMS OF A TORUS
Authors:	E. Shamarova, A. B. Cruzeiro
Presenting author:	Shamarova E.
Affilation:	University of Lisbon
E-mail:	evelina@cii.fc.ul.pt
Invited speaker:	
YRS seminar:	YES

We establish a connection between the strong solution to the spatially periodic Navier-Stokes equations and a solution to a system of forward-backward stochastic differential equations (FBSDEs) on the group of volume-preserving diffeomorphisms of a flat torus. We construct representations of the strong solution to the Navier-Stokes equations in terms of diffusion processes. Assuming the existence of a solution to the Navier-Stokes equations with the initial data in the Sobolev space H^s for sufficiently large s, we construct a solution of the associated system of FBSDEs. Conversely, if we assume that a solution of the system of FBSDEs exists in some sense, then the solution of the Navier-Stokes equations can be obtained from the solution of the FBSDEs. In fact, the constructed FBSDEs on the group of volume-preserving diffeomorphisms can be regarded as an alternative characterization of the Navier-Stokes equations for studying the properties of the latter.