LARGE, MODERATE DEVIATIONS PRINCIPLE AND α-LIMIT FOR THE 2D STOCHASTIC LANS-α

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Abstract. In this talk we consider the Lagrangian Averaged Navier-Stokes Equations, also known as, LANS-α Navier-Stokes model on the two dimensional torus. We assume that the noise is a cylindrical Wiener process and its coefficient is multiplied by $\sqrt{\alpha}$. We then study through the lenses of the large and moderate deviations principle the behaviour of the trajectories of the solutions of the stochastic system as α goes to 0. Instead of giving two separate proofs of the two deviations principles we present a unifying approach to the proof of the LDP and MDP and express the rate function in term of the unique solution of the Navier- Stokes equations. Our proof is based on the weak convergence approach to large deviations principle. As a by-product of our analysis we also prove that the solutions of the stochastic LANS-α model converge in probability to the solutions of the deterministic Navier-Stokes equations.