WELLPOSED PROBLEM OF A POLLUTANT MODEL OF THE KAZHIKHOV-SMAGULOV TYPE

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ABSTRACT. In this talk, we will present results on the wellposed problem of a pollutant model of the Kazhikhov-Smagulov type, which is derived by D. Bresch, E. H. Essoufi and M. Sy [J. Math. Fluid Mech. 9 (2007) 377–397]. For proper smooth data, existence and uniqueness is stated on a time interval, which becomes independent of the diffusion coefficient λ when λ goes to zero. A blow up criterion involving the norm of the gradient of the velocity in $L^1(0, T; L^\infty)$ is also proved. Besides, we show that if the density-dependent Euler system has a smooth solution on a given time interval $[0, T_0]$, then the pollutant model of the Kazhikhov-Smagulov type with the same data and small diffusion coefficient has a smooth solution on $[0, T_0]$. The diffusion solution tends to the Euler solution when the diffusion coefficient λ goes to zero. The rate of the convergence in L^2 is of order λ. . . .

This is joint work with Lin Fang (Hangzhou, China).