

STOCHASTIC DIFFERENTIAL EQUATIONS WITH SOBOLEV COEFFICIENTS

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Abstract: The new approach to Di Perna-Lions flow given by G. Crippa and C. De Lellis, based on maximal functions, has been successfully implemented by X. Zhang to stochastic differential equations. In this work, we will combine X. Zhang's method and the a priori L^p estimate of density for SDE to study SDE having coefficients in Sobolev spaces.

References

- [1] L. Ambrosio & A. Figalli (2009). On flows associated to Sobolev vector fields in Wiener space: an approach à la DiPerna-Lions, *J. Funct. Anal.*, **256**, 179–214.
- [2] G. Crippa & C. De Lellis (2008). Estimates and regularity results for the DiPerna-Lions flows, *J. Reine Angew. Math.*, **616**, 15–46.
- [3] R.J. Di Perna & P.L. Lions (1989). Ordinary differential equations, transport theory and Sobolev spaces, *Invent. Math.*, **98**, 511–547.
- [4] S. Fang & D. Luo (2010). Transport equations and quasi-invariant flows on the Wiener space, *Bull. Sci. Math.*, **134**, 295–328.
- [5] X. Zhang (2010). Stochastic flows of SDEs with irregular coefficients and stochastic transport equations, *Bull. Sci. Math.*, doi:10.1016/j.bulsci.2009.12.004.