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Hegelsmann-Krause model with environmental noise

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With the rapid development of the internet and social networks in the last decades, more people than ever can express and share their opinions. Even though everyone has access to this information, algorithms filter the opinions such that viewpoints, which lie outside your core beliefs, get ignored. The field of opinion dynamics describes such phenomenon through bounded confidence models. Based on the Hegelsmann-Krause model introduced by Rainer Hegelsmann and Ulrich Krause in 2002 we present a time continuous system of interacting particles, which is driven by idiosyncratic and environmental noise. In the limit we derive McKean-Vlasov equation. By employing a dual argument, the Ito-Wentzell formula in combination with reducing the time integrability via stopping time we show the existence and uniqueness of the non-local, non-linear McKean-Vlasov equation. Moreover, we present the propagation of chaos for the particle system by utilizing the associated stochastic partial differential equation.

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