Environmental Averaging: unified framework for alignment systems and its implementation to kinetic models

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In this talk we will discuss a new analytical framework which unifies many variants of alignment models such as Cucker-Smale, Motsch-Tadmor, multi-flocks, etc. The purpose of this framework is to understand functional properties of the core components of the alignment force – communication strength and density-averaged operation – and their effect on the collective dynamics of a particular differential system. One application of this framework is the proof of global relaxation for a class of Fokker-Planck-alignment models which includes the classical Cucker-Smale communication protocol.