

## Particle methods with transformed shapes for transport equations

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Particle methods are widely used for numerical resolution of transport equations, particularly in the framework of kinetic equations. Conceptually simple and relatively easy to implement, classical particle methods have the main drawback to often produce noisy solutions. The idea of the Linearly Transformed Particle method, developed by M. Campos-Pinto following an idea of A. Cohen et B. Perthame (2000), is to transform the shape functions of particles in order to follow the local variation of the flow. This method has been adapted and analysed for the Vlasov-Poisson system and for a compressible gradient-flow equation (work in collaboration with M. Campos-Pinto, J-A. Carrillo, Y-P Choi). In both cases the error estimate is improved compared to classical particle methods, with the obtention of a strong convergence of the particle solution.