
NATHALIE LANSON, University of Waterloo, 200 University Avenue West, Waterloo, ON N2L 3G1

Convergence Analysis of Renormalized Meshfree Schemes

Meshfree methods, also referred to as particle methods, have been recently developed for the approximation of hyperbolic problems and are now used in a wide range of applications, due to their ability to handle complex situations involving highly distorted systems. Renormalized meshfree schemes are based on a new class of approximation of derivatives that allows for better accuracy than classical particle methods. In this talk, I will discuss the analytical aspect of renormalized meshfree schemes; stability results will be presented as well as the geometrical conditions insuring stability, and the convergence of the schemes in the case of nonlinear scalar conservation laws will be established. Finally, the analogy made between finite volume schemes and meshfree schemes within the analysis will lead to the construction of some hybrid schemes.