
Mixed precision multigrid V-cycle method

Petr Vacek^{*1}

¹IFPEN – IFPEN, IFP Energies nouvelles, 1 et 4 avenue de Bois-Préau, 92852 Rueil-Malmaison, France. – France

Abstract

Modern parallel computers support computing in multiple precisions. There is extensive ongoing research on numerical methods exploiting this hardware feature. Some mixed precision methods are able to achieve the same overall accuracy as their uniform precision counterparts, while being faster, requiring less memory and consuming less energy. In this talk we discuss several ways of utilizing mixed precision in multigrid methods for solving systems of linear equations. We consider the application of multigrid both as a standalone solver or as a preconditioner for an iterative method. We present novel theoretical results and numerical experiments implemented in the Ginkgo library on GPUs.

^{*}Speaker