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Nonlinear waves and rheologies

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Nonlinear rheologies may cause deformation-reaction waves. Their numerical implementation issues will be discussed with emphasis on buoyancy driven flows under influence of far-filed and reactions-related stresses. Performance at GPU and CPU medium size clusters will be compared to the BG/p supercomputer. Efficiency of Godunov-type schemes to threat nonlinearities and gradient-type methods to treat phase boundaries will be presented.