

Two structure-preserving time discretizations for gradient flow. An application to GENERIC systems

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The equality between dissipation and energy drop is a structural property of gradient-flow dynamics. The classical implicit Euler scheme fails to reproduce this equality at the discrete level. We discuss two modifications of the Euler scheme satisfying an exact energy equality at the discrete level. Eventually, we address extensions to GENERIC flows and implement the case of the damped harmonic oscillator.

This is based on a series of joint works with A. Jüngel and U. Stefanelli.