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DK Seminar

June 1, 2016, 14:15 - 15:45

University of Vienna,

Oskar-Morgenstern-Platz 1, WPI seminar room, 8th floor

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A variational approach to symmetry, monotonicity, and comparison for doubly nonlinear equations

We prove, under suitably compatibility conditions, qualitative properties, e.g., symmetries, monotonicity, upper and lower bounds, sign properties, and comparison principles for a large class of doubly nonlinear evolutionary problems, including gradient flows, nonlinear parabolic equations, and some nonlocal problems. Our method is based on the so-called Weighted-Energy-Dissipation (WED) variational approach to doubly nonlinear systems. It consists in defining a global parameter-dependent functional over entire trajectories and proving that its minimizers converge to solutions to the target doubly nonlinear problem as the parameter goes to zero. Qualitative properties and comparison principles can be easily proved for minimizers of the WED functional and hence, by passing to the limit, for the target problem. We mention that our method does not require uniqueness nor regularity of solutions to the target problem.