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Dynamics of evolution PDE with memory

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In this talk, the asymptotic behavior of a semilinear heat equation as well as a damped wave equation containing long time memory are analyzed. We set up the problems in the usual framework for dynamical systems generated by differential equations with delay terms. This approach is different from the previous published literature on the long time behavior of heat and wave equations with memory, which were investigated in an extended space after having used the well-known Dafermos transformation. As a consequence, the obtained results provide complete information about the attracting sets for the original problem, instead of the transformed extended one (see [1, 2]).

References

- [1] S. Yan, J.H. Xu, T. Caraballo, J. Valero, Dynamics of damped wave equations with long time memory, *Commun. Nonlinear Sci. Numer. Simul.*, **156** (2026), 109631.
- [2] J.H. Xu, T. Caraballo, J. Valero, Asymptotic behavior of a semilinear problem in heat conduction with long time memory and non-local diffusion, *J. Differential Equations*, **327** (2022), 418–447.