Unbounded attractors for non-dissipative semigroups

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Dynamical systems governed by dissipative semigroups contain structures that are invariants and attracts every trajectory of the phase space, well know as global attractors, and by its own definition of dissipation, these global attractors are bounded sets. Nevertheless, in case of working with slowly non–dissipative semigroups, that is, its solutions can diverge to infinity as time tends to infinity, one can find also an invariant attracting structure, but in this case unbounded. We follow the study of Chepyzhov and Goritskii [1], to provide abstract results on the unbounded attractor existence. Furthermore, we study the properties of these attractors and the ω-limit sets for slowly non–dissipative semigroups. Finally, we illustrate the abstract results by the study of the autonomous problem governed by the equation $u_t = Au + f(u)$. This is a joint work with Jakub Bańaskiewicz, Alexandre Nolasco de Carvalho and Piotr Kalita, full developed in [2].

References

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