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*Asymptotics of Grow-Up Solutions and Global Attractors for Slowly Non-Dissipative PDEs.* Preliminary report.

We present recent results on the asymptotics of solutions to semilinear parabolic PDEs with linearly growing nonlinearities. We discuss extensions of inertial manifold techniques to a class of slowly non-dissipative dynamical systems and combine them with nodal property and Conley index methods to provide a complete solution to the Connection Problem and an explicit decomposition of the unbounded attractor for such systems. Furthermore, we show that the unbounded attractor for a slowly non-dissipative PDE is the limit of the global attractor of a corresponding dissipative PDE which limits to the original equation. (Received September 20, 2009)