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In this talk, we want to present some results about the attractors on time-dependent spaces. Firstly, we gave a sufficient and necessary condition for the existence of attractors on time-dependent spaces, which is equivalent to that provided by M. Conti et al. [JDE, 2013], and then we provided a technical method for verifying compactness of the process via contractive functions. Finally, we consider the long time behavior of the solution for the nonlinear damped wave equation

$$\varepsilon(t)u_{tt} + g(u_t) - \Delta u + \varphi(u) = f$$

with Dirichlet boundary condition, in which, the coefficient  $\varepsilon$  depends explicitly on time, the damping  $g$  is nonlinear and the nonlinearity  $\varphi$  has a critical growth, and show that the time-dependent attractors for the wave equations with nonlinear damping exists.

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