

ON A CLASS OF ODES MORE GENERAL THAN ALMOST-PERIODIC.

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In this work we present an alternative class of functions extending periodic and almost periodic functions which has the property that a bounded temporally global solution solution of a nonautonomous ordinary differential equation belongs to this class when the forcing term does is introduced here. Specifically, the class of functions consists of uniformly continuous functions, defined on the real line and taking values in a Banach space, which have pre-compact ranges. Besides periodic and almost periodic functions, this class also includes many nonrecurrent functions. Assuming a hyperbolic structure for the unperturbed linear equation and certain properties for the linear and nonlinear parts, the existence of a special bounded entire solution, as well the existence of stable and unstable manifolds of this solution are established. Moreover, it is shown that this solution and these manifolds inherit the temporal behavior of the vector field equation. A class of infinite dimensional examples involving a linear operator consisting of a time independent part which generates a C_0 -semigroup plus a small time dependent part is presented and applied to systems of coupled heat and beam equations.

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