

Title: Center manifold and stability in critical cases for some partial functional differential equations.

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Abstract: In this work, we prove the existence of a center manifold for some partial functional differential equations, whose linear part is not necessarily densely defined but satisfies the Hille-Yosida condition. The attractiveness of the center manifold is also shown when the unstable space is reduced to zero. We prove that the flow on the center manifold is completely determined by an ordinary differential equation in a finite dimensional space. In some critical cases, when the exponential stability is not possible, we prove that the uniform asymptotic stability of the equilibrium is completely determined by the uniform asymptotic stability of the reduced system on the center manifold.

Keys words:

Hille-Yosida operator, integral solution, semigroup, variation of constants formula, center manifold, attractiveness, reduced system, critical case, asymptotic stability, approximation.