On solution manifolds for differential equations with state-dependent delay

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Differential equations with state-dependent delays define a semiflow of continuously differentiable solution operators in general only on the associated *solution manifold* in the Banach space $C^1([-h,0],\mathbb{R}^n)$. For a prototypic example we develop a new proof that its solution manifold is diffeomorphic to an open subset of the subspace given by $\phi'(0) = 0$, without recourse to a restrictive hypothesis about the form of delays which is instrumental in earlier work on the nature of solution manifolds. The new proof uses the framework of algebraic-delay systems.

References

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