

FORMAL INTEGRABILITY AND NILPOTENT CENTERS ON CENTER MANIFOLDS IN \mathbb{R}^3

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Consider analytical three-dimensional differential systems having a singular point at the origin such that its linear part is $y\partial_x - \lambda z\partial_z$ for some $\lambda \neq 0$. The restriction of such systems to a Center Manifold has a nilpotent singular point at the origin. We study the formal integrability and the center problem for those types of singular points in the monodromic case. Our approach does not require polynomial approximations of the Center Manifold in order to study the center problem. We conclude the work solving the Nilpotent Center Problem for the Generalized Lorenz system and the Hide-Skeldon-Acheson dynamo system.

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