A Smooth Solution to Singular ODEs

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Abstract

Consider a linear system of singular ODE's $tu'(t) = A(t)u(t) + f(t)$, $0 < t \leq T$, where $A \in C^m_{n\times n}[0,T]$, $m \geq 0$, $n \in \mathbf{N}$. Necessary and sufficient conditions are presented for the existence of a unique solution $u \in C^m_n[0,T]$ for any $f \in C^m_n[0,T]$.