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## On Gevrey regularity of solutions for inhomogeneous nonlinear moment partial differential equations

We study the Gevrey regularity of formal solutions for a certain class of inhomogeneous nonlinear moment differential equations of the form

$$(1) \quad \begin{cases} \partial_{m_0;t}^\kappa u - P(t, x, (\partial_{m_0;t}^i \partial_{m;x}^q u)_{(i,q) \in \Lambda}) = \tilde{f}(t, x) \\ \partial_{m_0;t}^j u(t, x)|_{t=0} = \varphi_j(x) \text{ for } 0 \leq j < \kappa, \end{cases}$$

where  $P$  is a polynomial with coefficients analytic at a certain neighbourhood of the origin, the initial conditions are also analytic at a neighbourhood of the origin and the inhomogeneity  $\tilde{f}(t, x)$  is  $\sigma$ -Gevrey for some  $\sigma \geq 0$ . Our aim is to show the connection between the Gevrey order of  $\tilde{f}(t, x)$  and the shape of the Newton polygon for Eq. (1), and the Gevrey order of the unique formal solution of (1). The study effectively connects the methods and results from previous works on nonlinear partial differential equations and linear moment partial differential equations.

### REFERENCES

- [1] P. Remy, *Gevrey regularity of the solutions of some inhomogeneous nonlinear partial differential equations*, Electron. J. Differential Equations 2023(6), 1-28, 2023.
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