

ON GEVREY ASYMPTOTICS FOR SOME NONLINEAR INTEGRO-DIFFERENTIAL EQUATIONS

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We construct formal power series solutions of nonlinear integro-differential equations for given initial conditions which are holomorphic functions on a strip in the complex plane. We give sufficient conditions on the shape of the equations and on the initial conditions under which there exist actual holomorphic solutions which are Gevrey asymptotic to the given formal series solutions with respect to the time variable on sectors in \mathbb{C} . We get 1-Gevrey asymptotic expansions on sectors of opening less than π but not 1-summability as it is the case for linear partial differential equations. Moreover, our approach yields global analytic solutions of these equations in both time and space variables.