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Blow-up and complex time

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In my talk I want to study blow-up of partial differential equations from the perspective of complex time. The main example will be the semilinear heat equation

$$u_t = u_{xx} + u^2 \tag{1}$$

on a bounded or unbounded interval. For real u, x and real time t, this equation has already been well-studied in the literature. It has been shown, that solutions can blow-up in finite time. Bounded solutions are analytic in time and admit an analytic continuation into the complex plane. Following an idea of Masuda [1] and Guo [2] I construct the extensions of solutions to (1) to complex time.
In a first step I prove boundedness of solutions along proper complex time paths circumventing the blow-up point at time T. Then I study their properties, e.g. can they be continued back to the real time axis, do they agree as analytic continuation along different paths, what is their limit behaviour for complex times with large real part?

References

[1] K. Masuda, Analytic Solutions of Some Nonlinear Diffusion Equations, Math. Z. 187, 1984

[2] J.S Gou, H. Ninomiya, M. Shimojo, Eiji Yanagida, Convergence and blow-up of solutions for a complex-valued heat equation with a quadratic nonlinearity, Transactions of the American Mathematical Society, 2012