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# Lifespan of solutions to nonlinear Cauchy problems with small analytic data

Hidetoshi Tahara\*<sup>†1</sup>

<sup>1</sup>Sophia University – Kioicho, Chiyoda-ku, Tokyo, Japan

## Abstract

The effect of small initial data on the solutions of Cauchy problems has been extensively studied by many authors. Most of the research focus on the interrelated notions of lifespan, finite-time blowup, and global solvability.

In this talk, I will treat this problem from the standpoint of Cauchy-Kowalevsky theorem. Namely, I will consider the lifespan of solutions to the Cauchy problem for general analytic nonlinear partial differential equations with small analytic data. The main result is as follows: the lifespan of the solution becomes longer as the initial data become smaller, and the dependence of the lifespan on the smallness of the data is sharply described by the property of the equation.

This gives a generalization of results in Gourdin-Mechab (Temps de vie des solutions d'un probleme de Cauchy non lineaire, *C. R. Acad. Sci. Paris*, t. 328, Serie I (1999)), and Yamane (Nonlinear Cauchy problems with small analytic data and the lifespan of their solutions, *Banach Center Publ.*, 97 (2012)).

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\*Speaker

<sup>†</sup>Corresponding author: h-tahara@sophia.ac.jp