NUMERICAL EXPERIMENTS ON ANALYTICITY OF SOLUTIONS TO FRACTIONAL DIFFERENTIAL EQUATIONS

HIROSHI FUJIWARA
Graduate School of Informatics, Kyoto University,
Yoshida-honnachi, Sakyō-ku, Kyoto, 606-8501, Japan
(fujiwara@acs.i.kyoto-u.ac.jp)

NOBUYUKI HIGASHIMORI
Center for the Promotion of Interdisciplinary Education and Research,
Kyoto University,
Yoshida-honnachi, Sakyō-ku, Kyoto, 606-8501, Japan
(nobuyuki@acs.i.kyoto-u.ac.jp)

and

HITOSHI IMAI
Faculty of Science and Engineering, Doshisha University,
1-3 Tatara Miyakodani, Kyotanabe, Kyoto, 610-0394, Japan
(himai@mail.doshisha.ac.jp)

Abstract. In the paper, analyticity of solutions of fractional differential equations is investigated numerically. In numerical computation the Chebyshev spectral collocation method is used for discretization to realize arbitrary order approximation. Multiple-precision arithmetic is also used for arbitrary reduction of rounding error. Some one-dimensional fractional differential equations are solved numerically. Numerical results clarify analyticity of solutions.