Wang, Guotao; Ren, Xueyan; Baleanu, Dumitru
Maximum principle for Hadamard fractional differential equations involving fractional Laplace operator. (English) [Zbl 1447.35084]

Summary: The purpose of the current study is to investigate IBVP for spatial-time fractional differential equation with Hadamard fractional derivative and fractional Laplace operator \((-\Delta)^{\beta}\). A new Hadamard fractional extremum principle is established. Based on the new result, a Hadamard fractional maximum principle is also proposed. Furthermore, the maximum principle is applied to linear and nonlinear Hadamard fractional equations to obtain the uniqueness and continuous dependence of the solution of the IBVP at hand.

MSC:
35B50 Maximum principles in context of PDEs
26A33 Fractional derivatives and integrals
35R11 Fractional partial differential equations
35K20 Initial-boundary value problems for second-order parabolic equations

Keywords:
Hadamard fractional derivative; uniqueness and continuous dependence

Full Text: DOI