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Exact bounds and approximating solutions to the Fredholm integral equations of Chandrasekhar type. (English) Zbl 1412.45004

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Summary: In this paper, we study the L^p solutions of the Fredholm integral equations with Chandrasekhar kernels. The Hilbert type inequality is resorted to establish an existence and uniqueness result for the Fredholm integral equation associated with Chandrasekhar kernel. A couple of examples well support the condition and extend the classical results in the literature with one generalizing the classical Chandrasekhar kernel. In order to approximate the original solution, a truncated operator is introduced to overcome the non-compactness of the integral operator. An error estimate of the convergence is made in terms of the truncated parameter, the upper bounds of the symbolic function constituting the integral kernel and initial data to the equation.

MSC:

45B05 Fredholm integral equations
26D15 Inequalities for sums, series and integrals
47H10 Fixed-point theorems

Keywords:

Chandrasekhar kernel; Hilbert-type inequality; Fredholm integral equation; L^p norm; approximating solution

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