The fractional transport equation: an analytical solution and a spectral approximation by Chebyshev polynomials.

The unknown function $\Psi(\mathbf{x}, \mu, \phi)$ is prescribed on the sides of the rectangle. The solution is sought in the form of a series, after the transport equation is reduced to a family of linear equations of fractional type (sort of separation of variables), in which approach, the Chebyshev polynomials appear.

The first part of the paper is devoted in establishing some relationships involving these polynomials. Another example is treated and a general type is indicated.

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MSC:

45K05 Integro-partial differential equations  
45L05 Theoretical approximation of solutions to integral equations  
65D32 Numerical quadrature and cubature formulas  
82D75 Nuclear reactor theory; neutron transport  
40A10 Convergence and divergence of integrals  
41A50 Best approximation, Chebyshev systems

Keywords: fractional transport equation; approximation of solutions; Chebyshev polynomials

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