A comparison of hybrid functions based algorithms for computation of Fourier Bessel transforms

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In this paper a new numerical method, based on hybrid of Block-pulse and Chebyshev polynomials for numerical evaluation of integer and fractional order Fourier Bessel (Hankel) transform is presented. Hybrid of Block-pulse and Chebyshev polynomials are used as a basis to expand a part of the integrand, $rf(r)$, appearing in the Hankel transform integral. Thus transforming the integral into a Fourier-Bessel series and truncating it, an efficient algorithm is obtained for the numerical evaluations of the Fourier Bessel (Hankel) transforms of order $\nu >$ -1. The proposed method is quite accurate and stable, as compare to the existing algorithm based on hybrid of block-pulse and Legendre polynomials.