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Infinite Series Identities Involving a Large Class of Arithmetical Functions and Bessel Functions

We consider arithmetical functions generated by Dirichlet series satisfying "Hecke's functional equation," in the terminology of Chandrasekharan and Narasimhan in two famous papers published in 1961 and 1962. Two general classes of infinite series identities are discussed. Particular cases involve Ramanujan's tau-function $\tau(n)$; the number of representations of n as a sum of k squares, $r_k(n)$; and the sum of the k th powers of the divisors of n , $\sigma_k(n)$. Both classes of identities involve the modified Bessel function $K_\nu(z)$. This is joint work with Atul Dixit, Rajat Gupta, and Alexandru Zaharescu.