Lorch, Lee

Some monotonicity properties associated with the zeros of Bessel functions. (English)

Zbl 0731.33002
Arch. Math., Brno 26, No. 2-3, 137-146 (1990).

Supplementing and extending results of *A. Laforgia* and the reviewer [Z. Angew. Math. Phys. 39, No.2, 267-271 (1988; Zbl 0681.33008)], the author proves some monotonicity results for $a_{\alpha,k}$ and $(\alpha+2)a_{\alpha,k}$ where $a_{\alpha,k}$ is the kth positive zero of a solution of the generalized Airy equation $y''-x^{\alpha}y=0$. The method is to use $a_{\alpha,k}=[c_{\nu k}/(2\nu)]^{2\nu}$ where $\nu=1/(\alpha+2)$ and $c_{\nu k}$ are the positive zero of cylinder functions of order ν. The results are expressed in terms of the latter zeros. They depend heavily on known results for $c_{\nu k}$ including a formula due to G. N. Watson for $dc_{\nu k}/d\nu$.

Reviewer: M.E.Muldoon (Downsview)

MSC:

33C10 Bessel and Airy functions, cylinder functions, ${}_0F_1$
34C10 Oscillation theory, zeros, disconjugacy and comparison theory for ordinary differential equations

Keywords:

cylinder functions

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