Abstract

An upper bound for the first positive zero of the Bessel functions of first kind $J_\mu(z)$ for $\mu > -1$ is given. This upper bound is better that a number of upper bounds found recently by several authors. The upper bound given in this paper follows from a step of the Ritz's approximation method, applied to the eigenvalue problem of a compact self-adjoint operator, defined on an abstract separable Hilbert space. Some advantages of this method in comparison with other approximation methods are presented.