

Focal points of conjoined bases of linear Hamiltonian systems

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In 2007 J. Elyseeva introduced the concept of the comparative index as an efficient tool in matrix analysis, which has fundamental applications in the discrete oscillation theory. Recently the author jointly with R. Šimon Hilscher and independently J. Elyseeva implemented the comparative index into the theory of continuous time linear Hamiltonian systems and derived new and optimal estimates for the numbers of left and right proper focal points of conjoined bases of these system on bounded intervals. In particular, the main subject of this talk is to show that for a given nondegenerate compact interval there exist conjoined bases with any number of left proper focal points and any number of right proper focal points in the range between explicitly given minimal and maximal values. We also present a construction of such a conjoined basis in terms of initial conditions at a given point.

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