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Projective view at optimization problem for multiband filter. (English) Zbl 1477.41007

Summary: The best uniform rational approximation of the sign function on two intervals separated by zero was explicitly found by E.I. Zolotarëv in 1877. This optimization problem is the initial step in the staircase of the so called approximation problems for multiband filters which are of great importance for electrical engineering. We show that known in the literature optimality criterion for this problem may be contradictory since it does not take into account the projective invariance of the problem. We propose a new consistently projective formulation of this problem and give a constructive optimality criterion for it.

MSC:

41A20 Approximation by rational functions
41A50 Best approximation, Chebyshev systems
49K35 Optimality conditions for minimax problems
94C60 Circuits in qualitative investigation and simulation of models

Keywords:

uniform rational approximation; optimization of electrical filters; ansatz method; equiripple property; alternation; Stiefel class

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References:


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