

Geometric and operator measures of degeneracy for the matrix moment problems of Hamburger and Stieltjes

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The degeneracy measure for Hamburger matrix moment problem can be characterized by ranks of left and right radius of the limit matrix Weyl circle or a pair of deficiency numbers for the associated symmetric operator. These two measures degeneracy for Hamburger matrix moment problem are equal. The geometric measure of degeneracy for Stieltjes matrix moment problem are the ranks of Weyl limit intervals. But an operator measure of degeneracy for Stieltjes matrix moment problem has never been considered. We introduced an operator measure of degeneracy for Stieltjes matrix moment problem. It will be shown that the intersection of the deficiency subspaces of a pair of associated positive symmetric operators is such a measure. The geometric and operator measures of degeneracy for Stieltjes matrix moment problem are equal. We obtained certain new results for matrix moment problems of Stieltjes and Hamburger.