

QUASISEPARABLE REPRESENTATIONS OF MATRICES AND
DISCRETE SYSTEMS WITH BOUNDARY CONDITIONS

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We say that a matrix has quasiseparable order (n_1, n_2) if its submatrices from the strictly lower triangular part are of rank n_1 at most and submatrices from the strictly upper triangular part are of rank n_2 at most. The quasiseparable order defines representations of strictly lower and upper parts of matrices which are called quasiseparable representations. For numerical reasons one can treat matrices with quasiseparable representations as matrices of the input output operators of linear discrete time-varying systems with boundary conditions. This reduction allows to obtain linear complexity algorithms for multiplication of a matrix by a vector, product of matrices and matrix inversion.