New representations for weighted Drazin inverse of matrices

ABSTRACT

In this paper, the result are established in the following four ways: First, we present a general representation for the weighted Drazin inverse Ad,W of an arbitrary rectangular matrix A ∈ Mm,n involving Moore-Penrose inverse, which reduces to the well-known result if the matrix A is a square and W = In . Second, we find represenations for the weighted Drazin inverse of the Tracy-Singh product A B of the two matrices A ∈ Mm,n and B ∈ Mp,q by using our approach. Third,the results are extended to the case of Tracy-Singh product of any finite number of matrices.The result lead to equalities involving Kronecker product, Drazin inverse and group inverse, as a special case. Finally,We apply our result to present the solution of restricted singular matrix equations.