

New representations for weighted Drazin inverse of matrices

ABSTRACT

In this paper, the results are established in the following four ways: First, we present a general representation for the weighted Drazin inverse $A_{d,W}$ of an arbitrary rectangular matrix $A \in M_{m,n}$ involving Moore-Penrose inverse, which reduces to the well-known result if the matrix A is a square and $W = I_n$. Second, we find representations for the weighted Drazin inverse of the Tracy-Singh product $A \# B$ of the two matrices $A \in M_{m,n}$ and $B \in M_{p,q}$ by using our approach. Third, the results are extended to the case of Tracy-Singh product of any finite number of matrices. The results 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.