

## The Norm, Singular Value and Condition Number Analysis for the Hadamard Matrices

**Authors :** Emine Tuğba Akyüz

**Abstract :** In this study, the analysis of Hadamard matrices, which is a special type of matrix, was made under three headings: norms, singular values, condition number. Six norm types was applied to Hadamard matrices and the relationship between the results and the size of the matrix has been studied. As a result of the investigation when 2-norm was used on the problem  $Hx = f$ , the equation  $\|x\|_2 = \|f\|_2/\sqrt{n}$  was shown (H is n-dimensional Hadamard matrix). Related with this, the relationship between the the singular value of H and 2-norm and eigenvalues was shown. Then, the evaluation of condition number for  $Hx = f$  was made.

**Keywords :** condition number, Hadamard matrix, norm, singular value

**Conference Title :** ICMSS 2014 : International Conference on Mathematical and Statistical Sciences

**Conference Location :** Copenhagen, Denmark

**Conference Dates :** June 12-13, 2014