



ON THE INTERVAL GENERALIZED COUPLED MATRIX EQUATIONS*

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Abstract. In this work, the interval generalized coupled matrix equations

$$\sum_{j=1}^p \mathbf{A}_{ij} X_j + \sum_{k=1}^q Y_k \mathbf{B}_{ik} = \mathbf{C}_i, \quad i = 1, \dots, p+q,$$

are studied in which \mathbf{A}_{ij} , \mathbf{B}_{ik} and \mathbf{C}_i are known real interval matrices, while X_j and Y_k are the unknown matrices for $j = 1, \dots, p$, $k = 1, \dots, q$ and $i = 1, \dots, p+q$. This paper discusses the so-called AE-solution sets for this system. In these types of solution sets, the elements of the involved interval matrices are quantified and all occurrences of the universal quantifier \forall (if any) precede the occurrences of the existential quantifier \exists . The AE-solution sets are characterized and some sufficient conditions under which these types of solution sets are bounded are given. Also some approaches are proposed which include a numerical technique and an algebraic approach for enclosing some types of the AE-solution sets.

Key words. Interval arithmetic, Generalized coupled matrix equations, AE-solution set.

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