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CORRESPONDENCE

Comments on "On a transformation of the *-congruence Sylvester equation for the least squares optimization" by Satake, Y., Sogabe, T., Kemmochi, T., Zhang, S.L.

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Abstract. It is shown that the results obtained (using the Kronecker product) for solving the *-congruence Sylvester equation [9] were previously obtained by the LMI method for solving the modified matrix Sylvester equation [1], and both equations coincide up to the notation of matrix coefficients. It is noted that the algorithm proposed in [1] is more general than the algorithms presented in [9]. Contrary to the results of [9], the simplicity of the algorithm [1] allows one to use the mincx.m MATLAB package procedure for solving the matrix Sylvester equations, the numerical solution of which gives the accuracy 10-11 and 10-15 respectively in two specific examples.

Keywords: congruency Sylvester equation, LMI, Kroneker product, generalized Sylvester equation, system of linear algebraic equation.

AMS Subject Classification: 15A24, 15A39, 15A60.

In [9] the *-congruence (conjugated transposed) Sylvester equation is considered, which coincides with the Sylvester equation (14) from [1] to the accuracy of the designation of constant matrix coefficients both in [9] and in [1] respectively. * and H denotes the transposition and complex conjugation procedures. For different cases of the dimensions of the matrices included in equation (1) from [9], the solution is reduced to solving two "generalized" Sylvester equations (7) or (12) and systems of linear algebraic equations, using the Kronecker product, both of which are special cases of generalized matrix Sylvester equations (15) from [1], where the solution is also given using the LMI method.

Note that the algorithm proposed in [1], in contrast to [9], does not require refinement of the dimension of the known matrix coefficients included in the equation, and this confirms the generality of the algorithm [1] with respect to [9].

The authors did not give a single concrete example to illustrate their results and are going to "develop" computational algorithms in the future. However, the proposed in [1] algorithm is so simple that using the mincx.m MATLAB package, the finding the sought solution gives the accuracy of $10^{-11}$and 10^{-15} using specific examples.

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In the end, we note that the objectivity of citing of the scientific publications, which is the scientific ethics of scientists, was considered in [2-3]. For the correct orientation of the readers, we want to give an additional list of references [4-8] concerning the topics discussed in [9].

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