Solving engineering models using matrix functions*

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ABSTRACT

The importance of the wave equation in different areas of engineering and applied sciences is well known.

The semi-discretization method applied to that equation leads to a second-order matrix differential equation, whose analytical solution is expressed in terms of sine and cosine matrix functions. These sine and cosine matrix functions play a similar role as the exponential matrix function for first order matrix differential equations.

In this work, we improve the method based on Hermite matrix polynomials to compute sine and cosine matrix functions given in [1].

References

[1] **E. Defez, J. Sastre, Ibáñez, P. Ruiz**, Computing matrix functions solving coupled differential models. Mathematical and Computer modelling 50(5-6), 831-839, 2009.

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