An efficient method for estimating the optimal dampers' viscosity for linear vibrating systems using Lyapunov equation


Abstract. This paper deals with an efficient algorithm for dampers' viscosity optimization in mechanical systems. Our algorithm optimizes the trace of the solution of the corresponding Lyapunov equation using an iterative method which calculates a low rank Cholesky factor for the solution of the corresponding Lyapunov equation. We have shown that the new algorithm calculates the trace in \((m)\) flops per iteration, where \(m\) is a dimension of matrices in Lyapunov equation (our coefficient matrices are treated as dense).