VIII. CONCLUSION

In this paper, EMO based optimizations have been investigated in order to increase the dynamic performance of Stewart platforms. Three indices, including the dimensionally homogeneous Jacobian matrix condition number, minimum natural frequency in the workspace and local dynamic isotropy index at typical configurations, are introduced as objective functions in multi-objective optimal design.

Two classical Pareto-dominance based EMO algorithms including NSGA-II and MOPSO-CD are adopted to search for the Pareto-optimal frontier of our MOP. Performances of both algorithms are compared by defined coverage and spacing metrics. Results show that NSGA-II and MOPSO-CD obtain two incomparable solution sets. However, MOPSO-CD gets a better spacing performance and, moreover, saves computational time by at least an hour in 2000 computational generations. By synthetically considering, MOPSO-CD algorithm may be more competitive in solving our problem and the results are valuable in designing a Stewart platform for well dynamic performance.

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