

**Title: Optimized and phase-fitted on zero and non-zero dissipative hybrid methods for solving oscillatory initial value problems**

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In this research, based on the existing zero and non-zero dissipative hybrid methods we constructed the phase-fitted as well as optimized two-step hybrid methods. Phase-lag and amplification or dissipative errors are required in obtaining the phase-fitted methods whereas the phase-lag, dissipative error and the differentiation of the phase-lag relations are required in obtaining the optimized methods. The new sets of methods are tested upon a few oscillating problems over large intervals. Numerical results show that for the zero-dissipative methods the phase-fitted version is more efficient compared to the optimized methods, while for the non-zero dissipative methods the optimized version is computationally more efficient compared to the phase-fitted method