

A new algorithm for the solution of the unsteady adjoint equations is proposed in this article, aiming at overcoming the excessive computational cost and memory requirements of the conventional adjoint approach for the optimisation of unsteady problems in computational mechanics. The total cost is equal to four times the cost of the unsteady state solution, which is twice the cost of the conventional backward-in-time adjoint calculation but the memory requirements are very small, equivalent to those of a steady-state problem, while stability is acceptable. The proposed algorithm is validated in the case of the 1D unsteady Burgers equation with non-smooth source terms.