Table 6.1: Comparison of quasi-analytically computed sensitivity derivatives, $\frac{dC_L}{d\beta_{10}}$, with finite-difference for the airfoil optimization.

Strategy	Central Finite-Difference	Quasi-Analytic
1	0.673452#	0.673451
2	1.17407	0.826805
3 & 4	1.17407	1.17413

First-order spatially accurate
Higher-order spatially accurate

Table 6.2: Summary of the airfoil optimization results.

Strategy	C_L^F	C_D^F	Function Evaluations	Gradient Evaluations	CPU [Y-MP min]
1	0.5931	0.03517	43	6	5.2
2	0.8123	0.02978	37	5	12.9
3	0.8744	0.02989	39	5	18.4
4	0.8744	0.02989	39	5	23.6

F ≡ Final Optimized

Table 6.3: Summary of the multielement airfoil optimization results.

Initial Objective	Final Objective	Function Evaluations	Gradient Evaluations	Memory† [MW]	CPU Y/MP‡ [hr]
3.792	4.028	82	7	2.67/4.18	0.062/0.675

† Memory for CFD analysis/memory for sensitivity analysis.
‡ CPU time for converged CFD analysis/total optimization run time.