SHAPE GRADIENT OF THE LEAST-SQUARES OBJECTIVE FUNCTIONAL IN OPTIMAL SHAPE DESIGN RADIATIVE HEAT TRANSFER PROBLEMS

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ABSTRACT. Optimal shape design problems of radiative heat transfer are considered. The optimal shape design problem is formulated as an inverse one, which is reduced via the least-squares objective functional to an optimization problem. This minimization problem should be solved numerically. Gradient minimization methods need the gradient of a functional to be minimized. The shape gradient of the least-squares cost functional is derived with the help of the shape sensitivity analysis and adjoint problem method. As in the case of the boundary design problems the gradient is calculated by solving the direct and adjoint problems.