



# Sensitivity computation of periodic and chaotic limit cycle oscillations

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Sensitivity analysis can be a powerful tool for multi-disciplinary design optimization of nonlinear flow structure interaction. For computing sensitivity of time averaged quantities in chaotic oscillations, we demonstrate that conventional sensitivity analysis methods (tangent linear and adjoint methods) can produce erroneous results. This paper presents a new method for computing sensitivity derivatives for systems that exhibit both periodic and aperiodic (chaotic) limit cycle oscillations. This method overcomes the growth of sensitivity that disables traditional sensitivity analysis methods.

Comments: 16 pages, 6 figures; added appendices

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