Abstract Submitted
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A computational framework for adjoint-based study of flapping wings[1] MINGJUN WEI, New Mexico State University — The study of flapping wings has provided many challenges for numerical simulation and experimental measurement by the problem's unsteadiness, nonlinearity, moving boundary, fluid-structure interaction, and other factors. However, even with perfect flow field from perfect numerical simulation, there is still limited understanding of fundamental flying mechanism. The sensitivity information, as a higher order quality, shows sometimes the mechanism often hidden in direct numerical simulation and experiments. Adjoint-based method, by its nature, suits the best for solving sensitivity problems with large input space and small output space. The work presented here is to provide a general framework to apply adjoint-based method to solve the sensitivity of flapping-wing problems. Immersed boundary technique is used in dealing with the moving boundaries in both physical and adjoint spaces.

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