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Topology optimization of turbulent flows

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* The paper presents a fast and viable approach for taking into account turbulence in topology optimization of complex flow systems.

* Demonstrates inclusion of turbulence closure models with minimal implementation effort.

* Demonstrates a scalable and computationally cheap procedure for gradient analysis.

* Demonstrates that designs obtained without any simplifying assumptions in the derivation of discrete adjoints outperform those optimized under a frozen turbulence assumption.

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