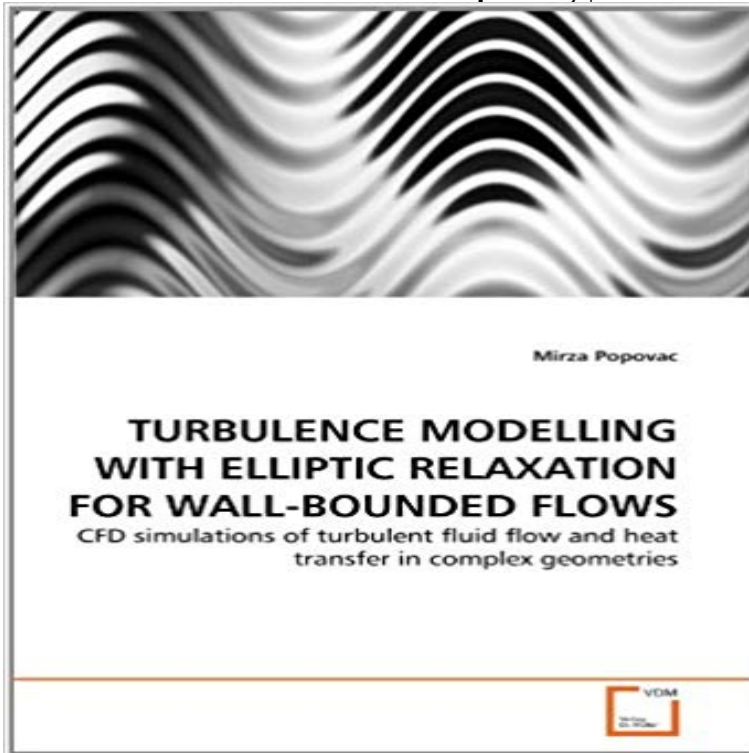


# TURBULENCE MODELLING WITH ELLIPTIC RELAXATION FOR WALL-BOUNDED FLOWS: CFD simulations of turbulent fluid flow and heat transfer in complex geometries



Computational Fluid Dynamics (CFD) became very powerful engineering tool for the analysis of complex fluid flow problems, as it incorporates modeling of important flow effects, including turbulence, heat and mass transfer. Concerning the turbulence models, however, the majority of CFD codes stay within the two-equation eddy viscosity approach due to its numerical stability and robustness. Although in the past many advanced turbulent models have been proposed, for complex engineering problems they are seldom used because of the concerns about their numerical stability and computational demands. This book presents the developments on turbulence modelling based on the elliptic relaxation idea. The presented turbulence modelling approach enables easy model implementation into a general purpose CFD code, while keeping high numerical robustness and low computational demands. With appropriate physical description of the near-wall flow effects (thus improved accuracy and reliability of the wall-bounded flow predictions), the proposed turbulence modelling is suitable for numerical analysis of complex wall-bounded fluid flow and heat transfer engineering problems.

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