

General Momentum Theory for Horizontal Axis Wind Turbines (Research Topics in Wind Energy)

By Jens Nørkær Sørensen



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This book reconsiders the basic approaches behind the BEM method and in particular assesses and validates the equations forming the general momentum theory. One part of the book concerns the validation, using numerical fluid mechanics (CFD), of the different terms in the equations forming the momentum theory. Other parts present new ideas for extending the theory and for enhancing the accuracy of the BEM approach. Besides a general introduction and explanation of the momentum theory, the book also deals with specialized topics, such as diffusor-augmented rotors, wind tunnel corrections, tip corrections, and combined momentum/vortex theory for design of wind turbine rotors. The book contains new as well as already published material, and the author has strived to put the material into a new and more consistent context than what usually is found in similar text books.

The book is primarily intended for researchers and experienced students with a basic knowledge in fluid mechanics wishing to understand and expand their knowledge on wind turbine aerodynamics. The book is self-consistent, hence all necessary derivations are shown, and it should not be necessary to seek help in other literature to understand the contents of the book.

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Editorial Review

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