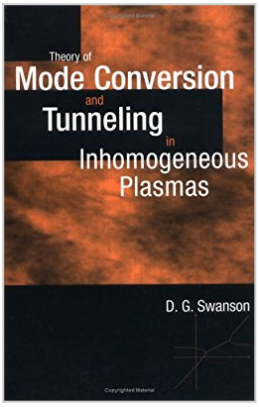

Theory of Mode Conversion and Tunneling in Inhomogeneous Plasmas

By D. G. Swanson

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A fresh look at the phenomenon of mode conversion with tunneling.

This volume provides a thorough analysis of plasma wave resonance absorption--a mode conversion process used in wave heating and diagnostics worldwide. The only book to incorporate mode conversion into a general treatment of plasma physics and plasma waves, it describes a broad range of applications and develops methods of mode conversion that are more advanced and precise than others in use today. This monograph presents the complete theory underlying the diagnostic implications of the process, combining estimates of tunneling, reflection, conversion, and absorption with emission. It surveys two decades' worth of developments in the field and:
* Brings together a wealth of information previously scattered in the professional literature
* Details numerous analytical and numerical results, many of which are published here for the first time
* Proves the surprising result that the phenomena of tunneling and absorption are independent
* Shows the link between the absorption and emission processes associated with resonances
* Features dozens of illustrations, as well as an extensive bibliography and references
* Appends a collection of mathematical formulas useful in plasma physics
* Offers via e-mail a variety of Fortran codes covering the examples in the book.

Theory of Mode Conversion and Tunneling in Inhomogeneous Plasmas is an essential reference for researchers working in plasma physics, space plasma physics, and fusion energy fields, and for anyone developing codes in plasma wave heating modeling. Its tutorial approach makes it invaluable for graduate students taking courses in plasma waves--whether in physics, electrical engineering, or nuclear engineering.

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Theory of Mode Conversion and Tunneling in Inhomogeneous Plasmas By D. G. Swanson Bibliography

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Editorial Review

From the Publisher
Plasma wave resonance absorption is a mode conversion process that is included in virtually all plasma wave heating modeling codes around the world. This text develops various methods of plasma wave heat modeling that incorporates recent advances in the field.

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About the Author
D. G. SWANSON is Professor of Physics at Auburn University, where he has taught for nearly two decades. He is the author of Plasma Waves.

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