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Didier Mazon (Ed.)

Diagnostics Development on the Route Towards Fusion Reactors

- Presents status in terms of Diagnostics both in ITER and DEMO
- Addresses critical issues related with the measurements of fast particles, fusion products, plasma facing components and radiation effects
- Discusses new concepts of detectors and developments

Thermonuclear fusion could offer a feasible and sustainable solution to future energy production needs. In this book, internationally prominent experts present lectures on their experiences with fusion reactors, sharing comprehensive information on diagnostic methods and how to interpret the results obtained with different methods. The lecturers focus on diagnostic developments for a tokamak demonstration fusion reactor (DEMO) and for the International Thermonuclear Experimental Reactor (ITER), which will face unprecedented challenges: as it uses tritium to fuel the reaction, it also produces extremely high temperatures, high-energy neutron flux and intense gamma radiation. The lectures cover a diverse range of topics, including magnetic fusion confinement (tokamak, stellarators), Inertial Confinement Fusion lasers, and plasma physics, with a particular focus on measurement applications and associated physics in connection with ITER and DEMO. They describe current developments in theory and experiments, while also discussing the fundamentals of this fusion reactor technology field. As such, the lectures offer a valuable resource for all students and researchers who are new to the field.

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