AKE 3: Fusion Research

Time: Monday 10:45–11:15 Location: A 151

Invited Talk AKE 3.1 Mon 10:45 A 151

Fusion Energy - Achievements and Challenges — •Gianfranco Federici — HoD, Power Plant Physics and Technology, EFDA CSU Garching, Boltzmannstr.2, Garching 85748 (Germany)

The technical basis for designing a next-step DT burning plasma experiment has greatly expanded during the last two decades thanks mainly to remarkable improvements in plasma performance and control in today's machines and advances in various areas of physics and engineering. Integrating and extending these advances toward long pulsed or steady state burning plasmas is now the focus of international tokamak research, which is proceeding with the construction of ITER in the south of France and JT60-SA in Japan.

However, beyond ITER there are still several physics and technology issues, which must be addressed and resolved for the design of a Demonstration Power Fusion Reactor (DEMO). The most important technology problems to be solved include the qualification of resilient materials for in-vessel components, the development of sound technological solutions for the divertor and of optimised remote maintenance schemes for high machine availability, the achievement of adequate thermal efficiency and tritium breeding, and the reliability and efficiency of heating and current drive systems. Among the physics questions, the divertor power exhaust, the definition of a reliable modes operation, etc.

This talk will review some of the most recent achievements in the field and describe the main technical challenges on the path to DEMO with emphasis on the activities being organised by the PPPT Team.