PORTUGAL AT THE TOP 4 OF PARTICIPANTS IN EARTH'S LARGEST NUCLEAR FUSION EXPERIMENT

Portugal has the fourth largest participation in experimental campaigns in the biggest nuclear fusion experimental reactor in operation, the tokamak JET. This participation is lead by Instituto de Plasmas e Fusão Nuclear (IPFN), a research unit of Instituto Superior Técnico (IST), Lisbon.

Eighteen IPFN researchers, corresponding to 7.5% of the total researchers participating in the experimental campaign, were selected at european level to participate in this experiment in the period June 2011-March 2012. This significant participation is only exceeded by Germany (21%), United Kingdom (16.9%) and France (12%). It should also be emphasized the selection of three IPFN researchers to become qualified operators (Session Leaders) of this experimental device.

JET (Joint European Torus, Culham, UK) is currently the only nuclear fusion device by magnetic confinement capable of operating with deuterium and tritium mixes. The experiment is collectively used by more than 40 laboratories members of EFDA (European Fusion Development Agreement), an agreement where Portugal is represented by IST, contributing to the programme more than 350 researchers and engineers of the whole European Union and Switzerland. Since 2000 that the portuguese participation in JET has been increasing, reflecting the high quality and international recognition of IPFN researchers.

Nuclear fusion reactions are similar to the process that supplies energy to the sun and other stars. The research in nuclear fusion aims at producing electricity based on the energy released in these reactions. Nuclear fusion is potentially an energy source capable of producing baseload electricity without producing greenhouse effect gases, with abundant fuel (deuterium is extracted from the sea water as well as the lithium used to produce the tritium) and much more safer than present reactors based on nuclear fission.

IPFN thas a significant and increasing participation in the various components of the collective use of JET by EFDA Associates: operation, scientific exploitation, hardware development and management of the experimental programme. Presently several projects are ongoing for the development of control and data acquisition systems and microwave diagnostics, areas at which IPFN competencies are largely recognized in Europe.

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