

Physics Cases and Instrumentation for the EURISOL-DF, next step towards Eurisol



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Neutron detectors for new physics opportunities

Neutron detectors are used extensively at almost every nuclear research facility across Europe and play a key role in the investigation of nuclear phenomena: in nuclear structure, for decay studies and as ancillary detectors for powerful in-beam spectroscopy arrays; in nuclear reactions, for the identification of the reaction channels and reconstruction of the complete kinematics; in nuclear astrophysics, for determining the neutron emission probabilities; in nuclear medicine and radioprotection, as radiation monitors and dosimeters; in material science, for neutron imaging techniques; in nuclear technologies and security applications, for the identification of fissile materials and cargo inspection.

The physics opportunities and characteristics of the new or upgraded facilities are demanding more powerful instrumentation which exploits their full potential. An overview of the actual neutron detection techniques and the last generation of detectors in operation worldwide will be provided. In addition, a highlight on various neutron detector R&D programs and related areas will be presented. As a summary, a global view of what instrumentation could be available or constructed for EURISOL-DF will be provided.

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