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Nuclear Reactor Monitoring with the Nucifer Neutrino Detector

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The detection of electron antineutrinos emitted in the decay chains of the fission products in nuclear reactors associated with accurate simulations provides an efficient method to assess both the thermal power and the evolution of the core fuel composition. This information could be used by the International Agency for Atomic Energy for safeguarding civil nuclear reactors in the future. The Nucifer experiment aims to demonstrate the concept of 'neutrinometry' at the pre-industrialized stage. A novel detector has been designed to meet IAEA requirements and it has been deployed at 7 m away from the Osiris research reactor at CEA-Saclay. We report the detector performances and the first detection of neutrinos compared to backgrounds. We discuss the ability of the Nucifer detector to detect a possible non-standard operation of a nuclear reactor.

Country or International Organization

France

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