Centre d'Etudes Nucléaires de Bordeaux-Gradignan

Gradignan, January, 24 2020

Referee report for the **51st meeting of the PAC for Nuclear Physics**

**Investigations of neutron nuclear interactions and properties of the neutron: status and prospects**

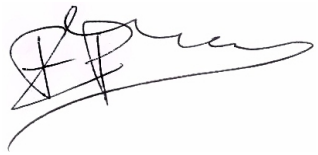
The group involved in this theme has a wide range of activities related to neutron physics from fundamental research to applications.

On the fundamental part, the development of a neutron reflector based on diamond nanoparticle is essential to allow the construction of a prototype of an ultra-cold neutron source. The measurement of neutron lifetime is also a very important objective with a lot of implications. The contribution of the theory to these activities is a strength of this group.

The nuclear reaction program addresses some issues on fundamental symmetries breaking with polarized beams, measurements of gamma-ray yields and angular distribution for different nuclei, study of nuclear fission induced by neutrons and measurement of neutrons capture reactions of astrophysical interest. This program is really pertinent and ambitious.

The applied research using nuclear physics methods program has several aspect. A large part of the activities is done in the framework of the international program "Atmospheric Deposits of Heavy Metals in Europe - Estimation Based on the Analysis of Biomonitor Mosses," insuring thanks to the quality of the work a visibility of JINR in this field. There are several prospectives with a possible program with a modernized EG-5 accelerator, the development of a non-destructive method by neutron resonance spectroscopy to analyze elementary composition of samples and the measurement of isotopic composition of sample with a Ge detector at IBR-2 reactor.

The presented program addresses essential subjects on neutrons physics. The group in this theme has strong international collaboration with other entities reflecting the expertise and the know-how the physicist participating to these activities. The continuation of this program should be strongly supported.



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