

Referee report to the 49th PAC at JINR on "Nuclear Physics at a new Dubna neutron source"

A new Dubna Neutron Source DNS-IV is a very interesting project, which is going to change the research landscape of neutron science and technology in the world.

I refer this report also to works [1,2] cited in the abstract of the project presentation and would like to underline that the project brochure covers the subject in detail and from various approaches. Both considered alternative options for the neutron source design are based on novel original concepts proposed/developed at JINR. They are efficient in terms of invested resources and provide record parameters of the neutron source.

It is important and advantageous to have alternative designs for DNS-IV at this early stage of the project and perform their comparative analysis from different points of view in order to select one of them at a later stage.

The project is timely. Although the existing Dubna neutron source started operating quite recently, development and construction of a new source of another generation would take significant time, therefore, should be pursued already now.

As research at a powerful neutron source is multidisciplinary, including condensed matter physics, nuclear and particle physics, it is natural that this project is considered at more than one PAC.

I recommend to fully support this project, and will give recommendations that are more specific.

- to use the existing neutron source in Dubna for the development of new technologies needed for the construction of DNS-IV and its instrumental program, for building and testing prototypes needed to verify future technical and methodical solutions;
- to favor technical solutions and experimental programs, which would use a key advantage of DNS-IV: pulsed structure of neutron beam and record peak intensity.

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