

2010/1/22: Neutron Program Advisory Committee

Program ID: 2009S03

Title: "Fundamental Physics with Pulsed Cold Neutrons"

Principal Investigator: Hirohiko Shimizu

Decision: continue

Beam allocation: $\beta = 100\%$

Approval and suggestion(s) to IMSS: budget and resources

The additional radiation shields should be constructed. Other proposed budgets should be reconsidered in IMSS.

Comments:

The research group of the program No. 2009S03 proposed to apply the pulsed cold neutron beam to improve the accuracy of the decay parameters using in-flight geometry, search for unknown medium-range forces, measurement of the neutron phase induced by the electric field and the gravity using multilayer interferometers.

The PAC recommends the IMSS to promote the research program No. 2009S03 as a unique approach to fundamental physics using the instantaneously bright pulsed cold neutron beam of the J-PARC. The research program involves the construction of the NOP beamline at the BL05 in the MLF. The major part of the upstream optics is under commissioning and the preparation of the physics data production is in progress. The PAC supports to concentrate to the lifetime measurement at the beginning stage and expects to improve the accuracy of the in-flight lifetime measurement at the level of 10 seconds in the fiscal year of 2010 and further improve it down to the level of 1 second or less in 2011 or later.

This research program is largely overlapping with the particle and nuclear physics. The IMSS will discuss a new efficient framework to interact with the Institute of Particle and Nuclear Studies of KEK.