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Referee report: **Annotation of the EDELWEISS-LT project**

"Direct low-mass WIMP searchers with HPGe Semiconductor Bolometers"

This project seeks to address the question of the nature of dark matter (DM), whose existence is widely inferred – from unexplained mass in gravitational lensing calculations, which affects the motions of baryonic matter and light; galaxy clusters and galactic rotational curves; cosmic microwave background and others – and yet there is no direct observational/experimental evidence. Among many models is the cold dark matter (CDM) composed on non-relativistic particles whose evidence could be through interaction with normal matter via elastic scattering processes that could be picked up in recoil detector systems. One of the promising predictions of DM candidates could be weakly interacting massive particles (WIMP) whose existence has been predicted by many extensions of the standard model. The search for WIMP involves attempts at direct detection by highly sensitive detectors, as well as attempts at production by particle accelerators.

The EDELWEISS program, located at the LSM facility in Modane, searches for direct evidence of Dark Matter(DM) WIMP from the Milky Way galaxy through their scattering of Ge nuclei within cryogenic high purity Ge (HPGe) crystals. The current setup is built on the expertise obtained from the EDELWIESS-III program which showed a new exclusion limit in the low-mass WIMP region of 4-30 GeV. The next stages of this programme will focus on the low-mass WIMPs region of 10 GeV/c^2 (and below) which has attracted considerable interest following the non-detection of SUSY at the LHC – and seems to have gained favourable theoretical predictions of late. Furthermore, the new detectors allow for hitherto unreachable energy resolutions of 100 eV as a result of the HPGe bolometers which take advantage of the Neganov-Luke effect of internal amplification of the heat signal. This will enable the group to measure light WIMP-nucleon cross-section on the level better than 10^{-41}cm^2 with best results of other competitive experiments.

The DzLNP JINR team of the EDELWEISS project brings expertise and experience of many years to this project and there is a clear articulation responsibilities and roles for the team.

I strongly support the proposal.

Zeblon Z Vilakazi

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