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Experiment on search for neutron–antineutron oscillations using a projected UCN source at the WWR-M reactor

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An experiment on search for neutron–antineutron oscillations is proposed based on the storage of ultracold neutrons (UCNs) in a material trap. The main factors influencing sensitivity of the experiment are the trap size and the amount of UCNs trapped. A high-intensity UCN source will be created at the WWR-M reactor of Petersburg Nuclear Physics Institute, which must provide an UCN density two to three orders of magnitude higher than that in the existing sources. The results of simulations of the experiment for detecting neutron–antineutron oscillations with the new source show that the sensitivity can be increased by ˜ 20–80 times compared to existing sensitivity. The range depends on the model of neutron reflection from walls.

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