Abstract

We propose to measure the production and detection of UCN in a prototype superfluid helium-filled neutron EDM measurement cell on the PF1B beamline. This is the first of three planned phases by a new, international collaboration to demonstrate the feasibility of such an experiment.
In particular, this measurement will address the optimal production of UCNs, the dependence of the capture rate on the 3He concentration, as well as beta-decay and beam-induced background.
We will use largely existing equipment including a cryostat with a 3He evaporation refrigerator to cool a volume of superfluid helium containing the measurement cell which will be filled through a superleak, similar to that used in the SuperSUN apparatus. A number of prototype measurement cells have been produced and the light-collection system is also nearly complete.