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Development of fixed-field gradient magnet in time focusing system for ultracold neutron beam

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It is proposed to construct ultra-cold neutron (UCN) source and to perform an experimental search of neutron electric dipole moment (nEDM) at J-PARC in Japan. One of key technique in the proposal is time focusing of UCN beam with so-called "rebuncher"s. In the rebuncher, fast UCNs in a bunch are decelerated and slow ones are accelerated by using a rf spin flipper and a fixed-field-gradient magnet. As the results, a stretched-bunch-length due to time of flight difference in velocity during a transportation will be shortened at an nEDM measurement apparatus and the density of UCN at the apparatus will be increased. The magnet of the rebuncher has a unique feature. Here a development status of the magnet will be described.

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