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A 10-Boron based high count-rate area detector for UCN

abstract: With a future EDM-experiment at PSI (Switzerland) in mind, we adapted the CASCADE neutron detector for the application as an UCN-detector (CASCADE-U). It is a hybrid, solid converter gas detector. The detector has the conceptual advantage of inherent high count-rate capability, insensitivity to magnetic fields, minimal sensitivity to thermal neutron- as well as gamma-background (always present at UCN-sources), high robustness and finally a charge detection mechanism independent of the neutron converter, giving an overall low operating pressure and thus allowing to minimize detector window thickness. UCN-detection efficiency (meaning the probability that an incoming UCN will traverse the window and be detected) can thus be found as high as 80%.