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NEON - Neutrino Elastic-scattering Observation with NaI(Tl)

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NEON is a proposed experiment to detect coherent elastic neutrino-nucleus scattering (CENNS) with high light yield NaI(Tl) detectors and a reactor as antineutrino source. Due to extremely low energy signal predicted from the CENNS process, one needs to develop extremely low threshold detectors. We have optimized size of the crystals and developed new optical coupling design for high light collection efficiency. With current best crystal of approximately 23 photoelectrons per keV, a sub-keV scintillation signal is accessible with the NaI(Tl) crystals. We consider to install approximately 10-kg target mass at Hanbit reactor power plant, which is same place of the NEOS short baseline neutrino experiment, in early 2020. The site is 24 m far from reactor core with measured antineutrino flux of $7 \times 10^{-12}/\text{cm}^2/\text{s}$. We will present current status of detector developments as well as our strategy for an observation of CENNS process with the reactor antineutrino.

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