

**National Centre for Scientific Research
National Institute of Nuclear and Particle Physics**

Support for SoLid antineutrino detector development

Antineutrinos are produced in large numbers in the core of a nuclear reactor. Antineutrinos are linked to the nuclear fission, and therefore they are of interest in nuclear nonproliferation. Fundamental and applied antineutrino research has already proven the feasibility of the method to monitor reactor power and production of plutonium, including detection of diversion scenarios which are of particular interest to nuclear safeguards.

One of the major obstacles to apply antineutrino monitoring to routine safeguards has been the detector itself which is a massive lead-shielded liquid scintillator containing hazardous chemicals, and even more important, the present design is not optimal in discriminating the key signal, the fast neutrons from photons and muons. However, recent scientific research has opened another way to eliminate the disturbing background radiation. An array of plastic detectors combined with ^6Li coating provides perfect means for signal discrimination without massive shielding. The new Solid detector is a safe, relocatable and sensitive antineutrino detector which suits well for an installation above ground.

I give my full support to the SoLid research project, and believe that the success of this segmented detector system will be a breakthrough in antineutrino detection technology which paves the way for safeguards applications.

Helsinki, 18 Jun 2013

A handwritten signature in blue ink, appearing to read "Harri Toivonen".

Harri Toivonen, PhD
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