CNT assemblies were fabricated using Langmuir–Blodgett nanotechnique by depositing two monolayer of single-walled carbon nanotube on a nanoporous aluminium-oxide support. Then the sample was arranged in the detector collimator. Impact of CNTs on ^{60}Co γ-rays passage is in enhancement of both full-energy peaks (photopeaks) and escape peaks. Figure 1 depicts the experimental evidences of CNT-assembly enhanced scattering of ^{60}Co γ-ray in the detector crystal. Radiation vortical defects emerge in a result of the interaction of γ-ray with CNTs.

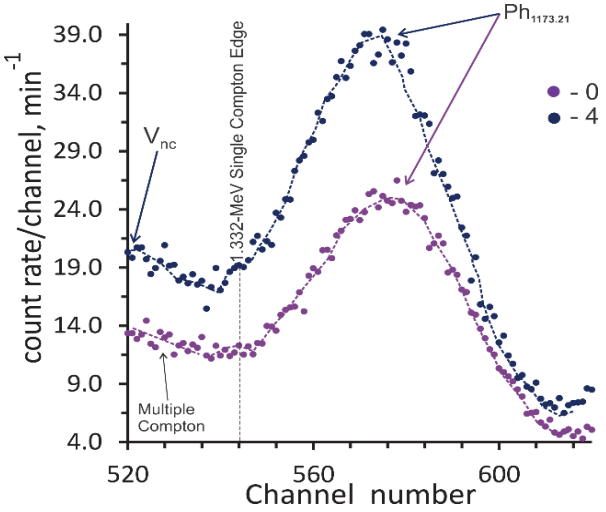

Fig. 1. Photopeak and Single Compton edge in 1.332-MeV-γ-ray spectra recorded by the two scintillation detectors: NaI(Tl)- and NaI(Tl)/CNT-crystal systems. The enhanced 1.332-MeV-γ-ray-backscattering event and the 1.1732-MeV-energy deposition in detector are observed in the radiation dark-blue spectrum ``4'' recorded by the 2nd detector. The responses on these events being recorded by the 1st detector in the violet spectrum``0'' are weak. The peak of deposition of full 1.1732-MeV photon energy is labeled by $Ph_{1.17321}$; a peak attributed to vortical CNT defect is denoted by V_{nc}.

So, a new ^{60}Co IRS-detecting method based on CNT-assembly platform is offered. It is demonstrated that the method is capable of recording low-intensity flows of escaping photons.

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Model-independent constraints on the mass and couplings of extra neutral boson in the process of e^+e^- annihilation at the ILC and CLIC

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Heavy neutral gauge boson Z' are predicted by many theoretical schemes of physics beyond the Standard Model, and intensive searches for their signatures will be performed at future high energy e^+e^- colliders. In this paper, we have obtained model-independent constraints on the Z' mass and couplings for the ILC and CLIC experiments.

Study of rod ejection accidents for VVER-1200 at different initial states using DYN3D code

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Control rod ejection is transient accident that could occur during different states of NPP campaign and lead to overheat in the core of NPP. There is a significant difference in behavior for various initial states such as control rod ejection at full power or hot zero power state of NPP.
Thus such cases meant to be examined separately, especially if one also changes fuel gap in fuel element. One of the most important values to be estimated is DNBR – departure from nucleate boiling rate that show how close one come to incident with uncontrollable overheating of fuel rods due steam blanket insulating.
In this paper we study and examine its behavior at different initial states of NPP and fuel rod fuel gap during control rod ejection in VVER-1200.