Present status of experiment Neutrino-4

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for collaboration

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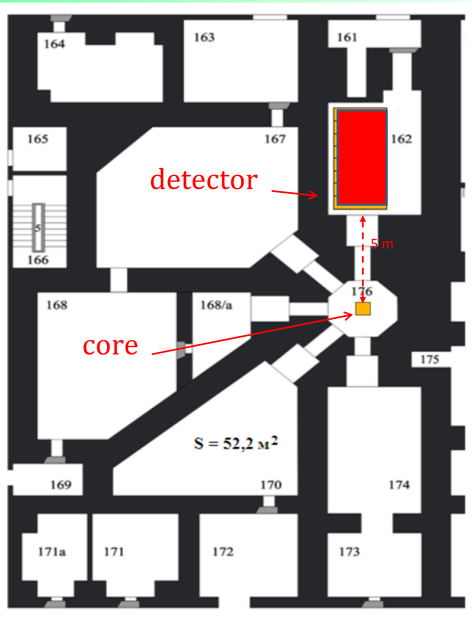
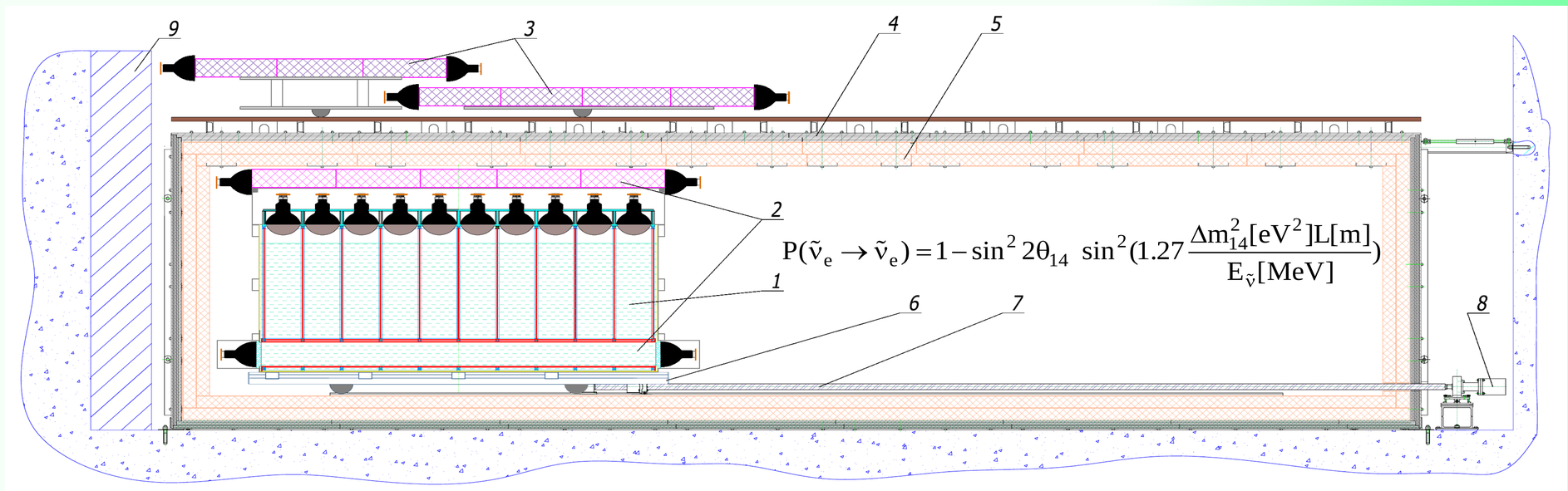
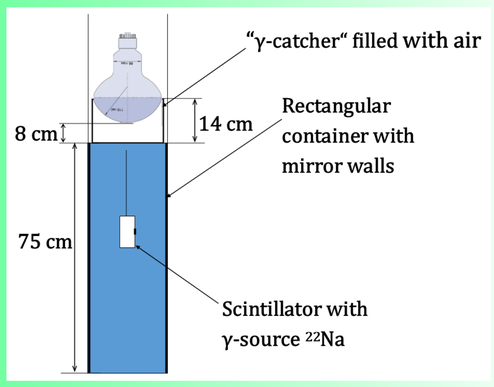
Reactor: SM-3 reactor in Dimitrovgrad (Russia): 100 MW compact core 35x42x42 cm³

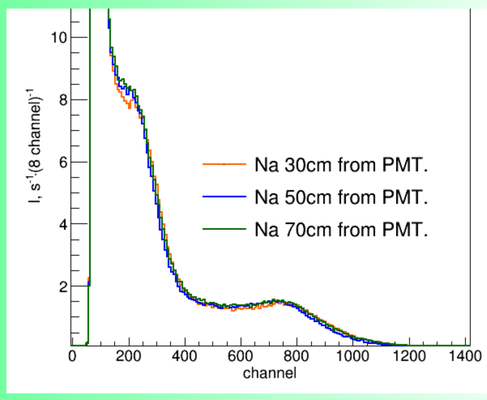


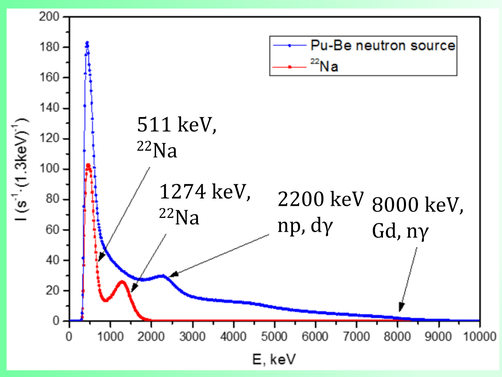


Location in building and general scheme of experimental setup. 1 – detector of reactor antineutrino with 50 PMT-9354, 2 – internal active shielding, 3 – external active shielding (umbrella), 4 – steel and lead passive shielding, 5 – borated polyethylene passive shielding, 6 – moveable platform, 7 – feed screw, 8 – step motor, 9 – iron shot.

Detector calibration

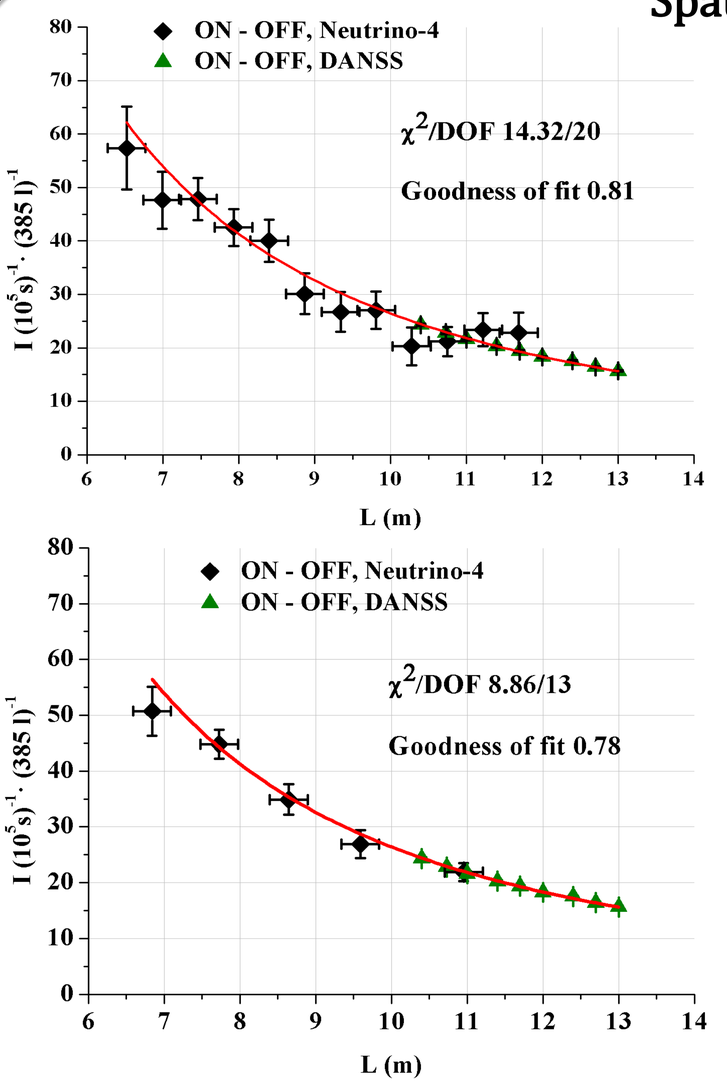


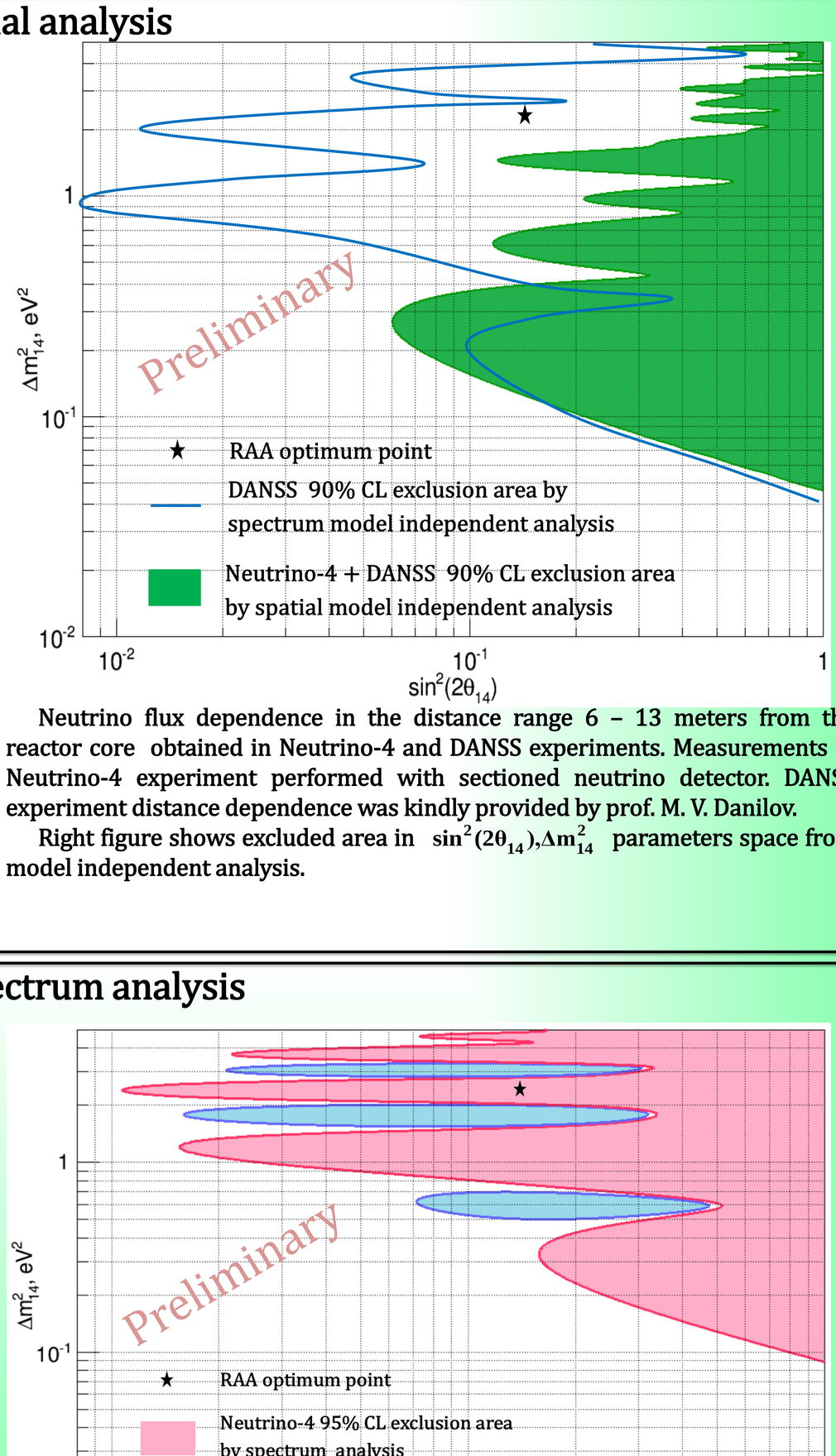




The measurements with model of full-scale detector section indicate the possibility to use such design to obtain reactor antineutrino spectrum. Position of the 1274 keV peak from ^{22}Na γ-source do not depend on distance between source and PMT. The bottom figure shows calibration of two detector's rows with ^{22}Na γ-source and Pu-Be fast neutrons source

Spatial analysis

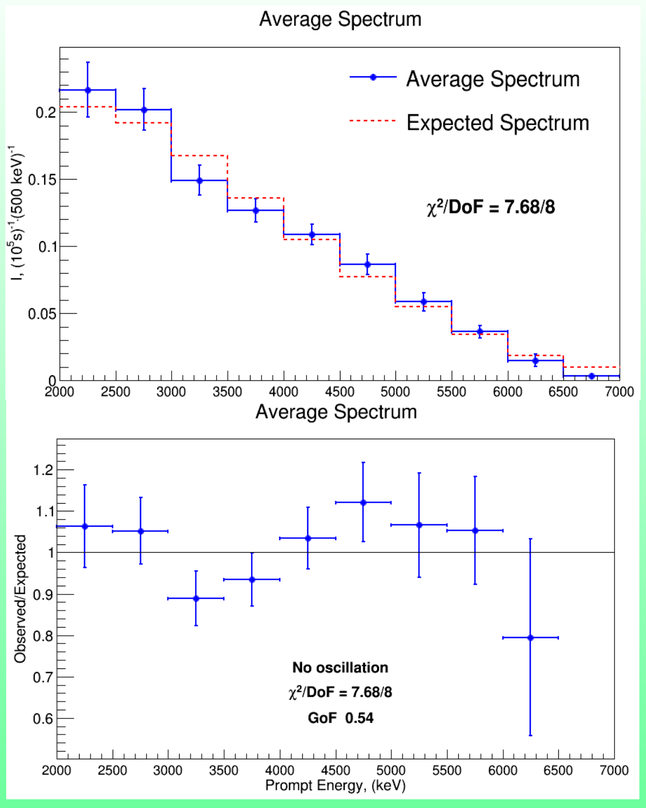




Neutrino flux dependence in the distance range 6 – 13 meters from the reactor core obtained in Neutrino-4 and DANSS experiments. Measurements in Neutrino-4 experiment performed with sectioned neutrino detector. DANSS experiment distance dependence was kindly provided by prof. M. V. Danilov.

Right figure shows excluded area in $\sin^2(2\theta_{14}), \Delta m^2_{14}$ parameters space from model independent analysis.

Spectrum analysis



Statistical accuracy of the spectra measured in different distances from reactor core is not enough. Therefore we use averaged over all distances spectrum and compare it to result of Monte-Carlo modeling.