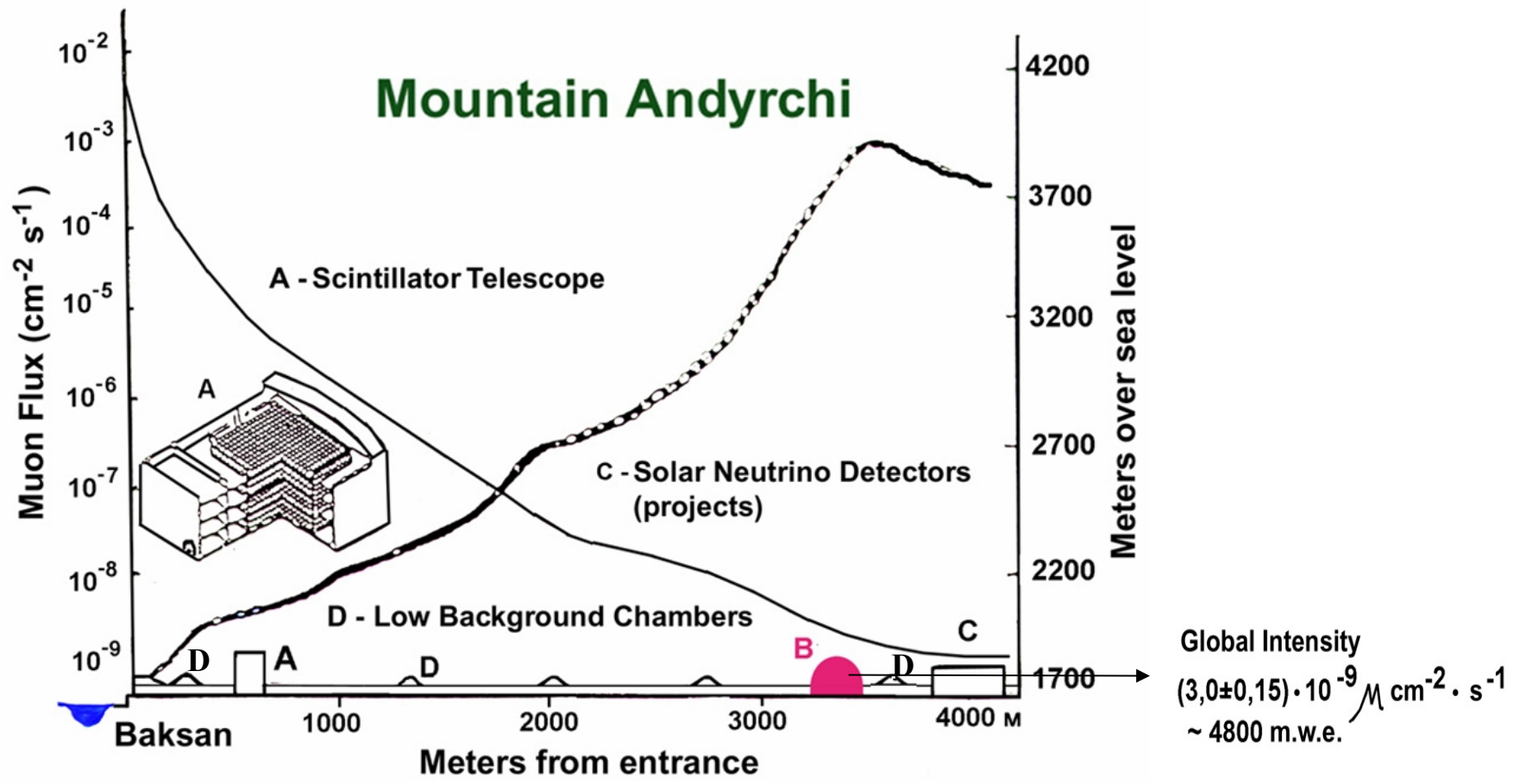
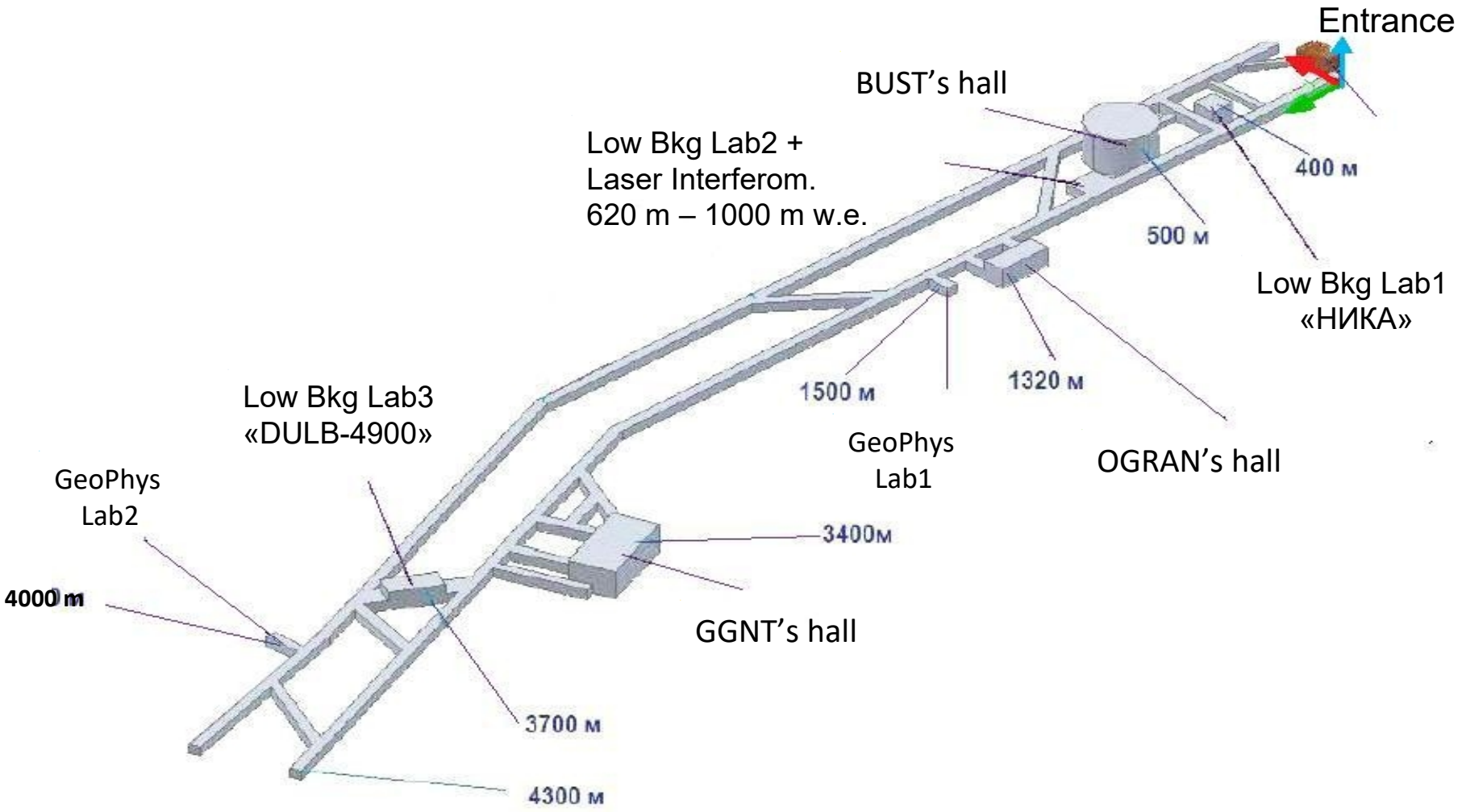
LABORATORY OF LOW BACKGROUND RESEARCH

General view of underground objects of BNO



Schematic view of a section of the Andyrchy slope along the adit (right scale) and dependence of underground muon flux on the laboratory location depth (left scale).

General view of underground objects of BNO

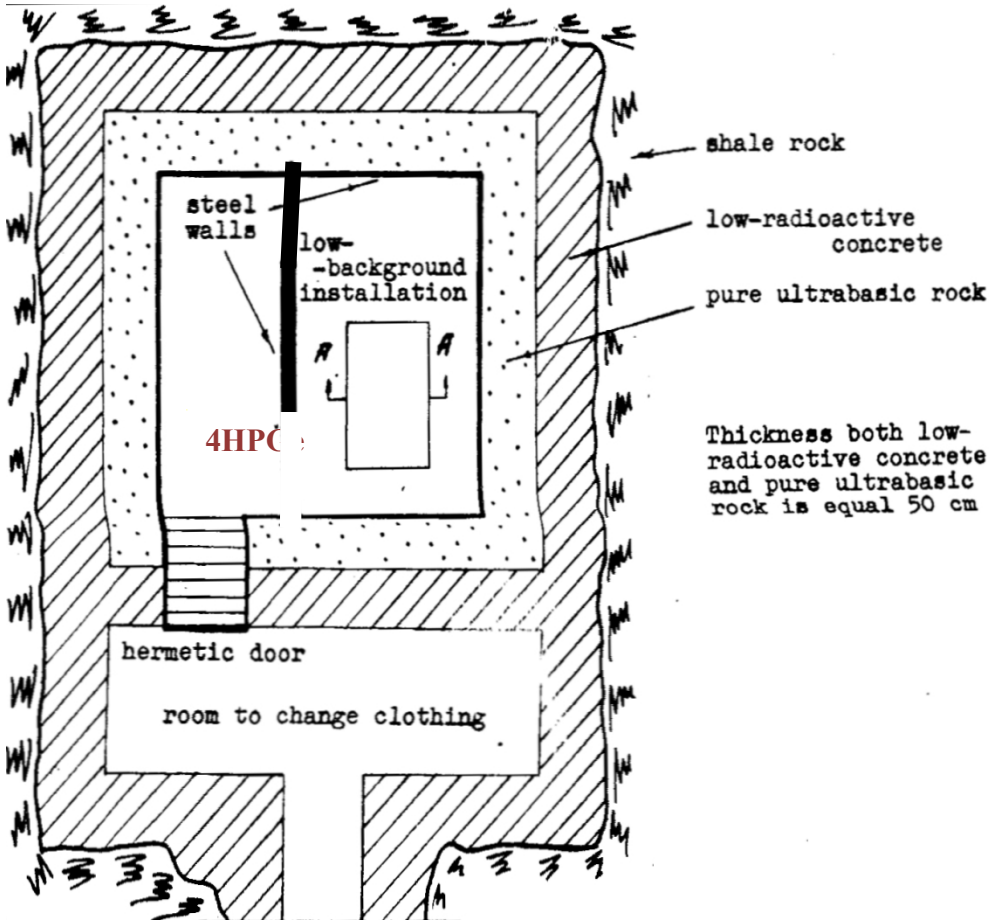


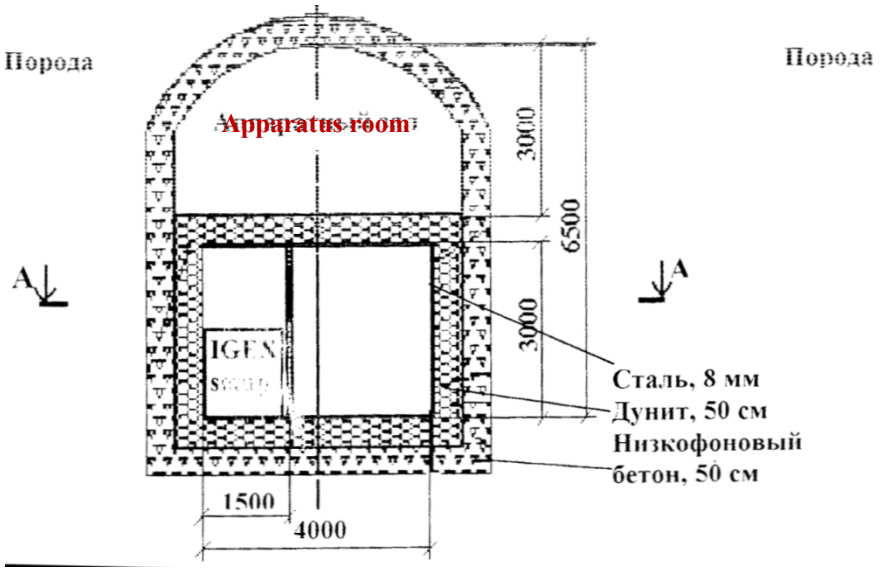
Scientific progamm

- Search for double K-capture of ^{124}Xe
- Search for Solar hadronic axions
- Measurement of decay constant of different nuclides
- Measurement of concentration of ^{14}C in scintillators
- Material screening (measurement of radiopurity of different materials)

LBL «NIKA»(«НИКА»)

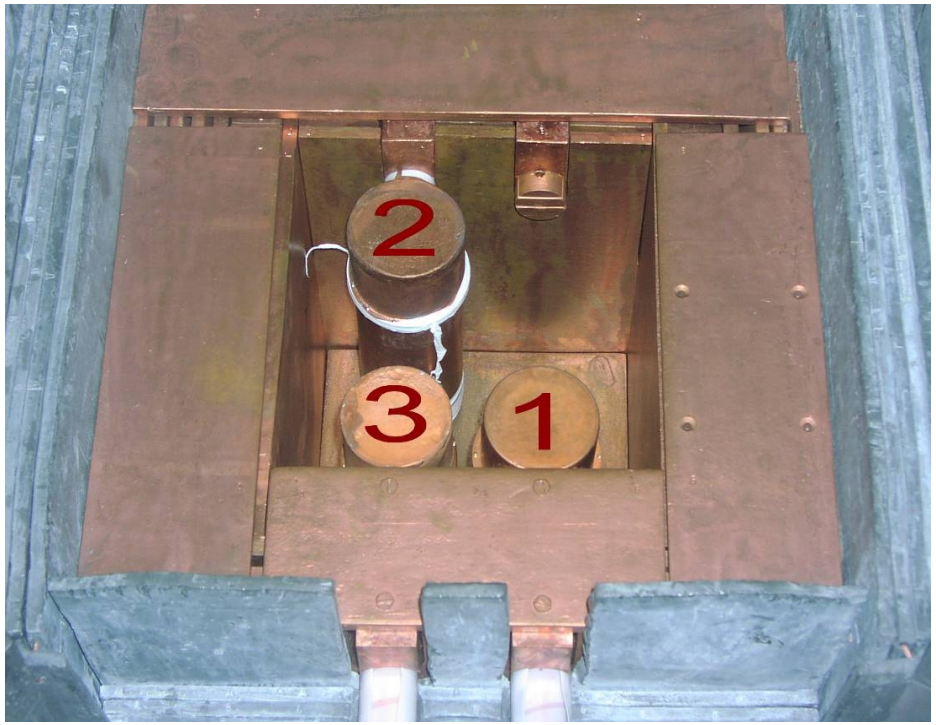
Low-background laboratory at a depth of 660 m w.e, 385 m from the entrance of the tunnel, useful area of ~100m², operation stsrted in 1974





E.L.Kovalchuk, V.V.Kuzminov, A.A.Pomansky, G.T.Zatsepin. "Deep underground laboratory for low-radioactivity measurements". Proc. of the Int. Conf. on Low-Radioactivity Measurements and Applications, The High Tatras, Czechoslovakia, October 6-10, 1975. Comenius University, Bratislava, Slovenske Pedagogicke Nakladatel'ctvo, 1977, 23-27.

Low background germanium gamma-spectrometer

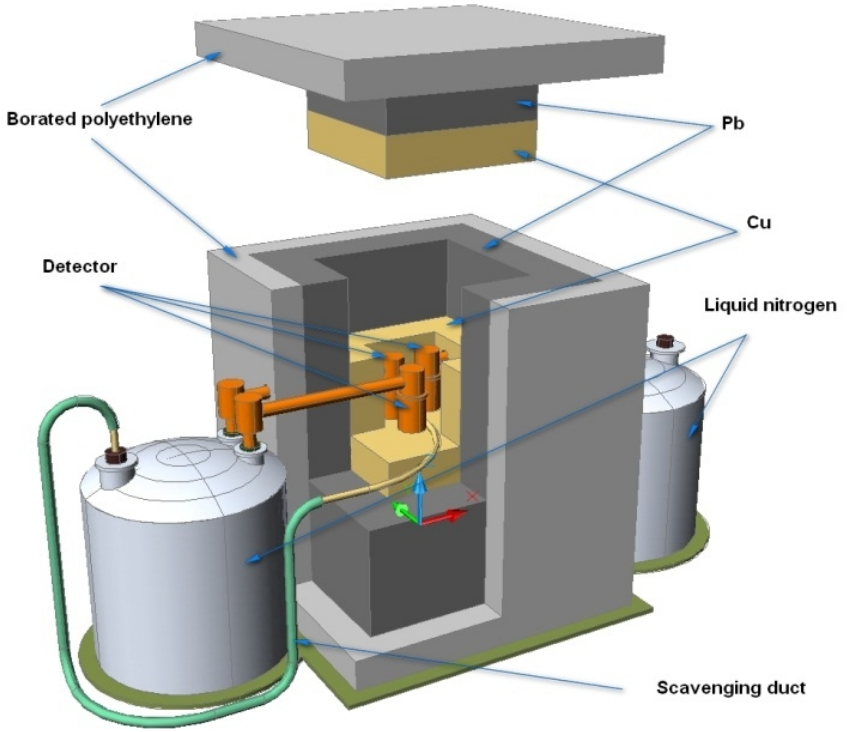


Passive shield:

80 mm borated polyethylene

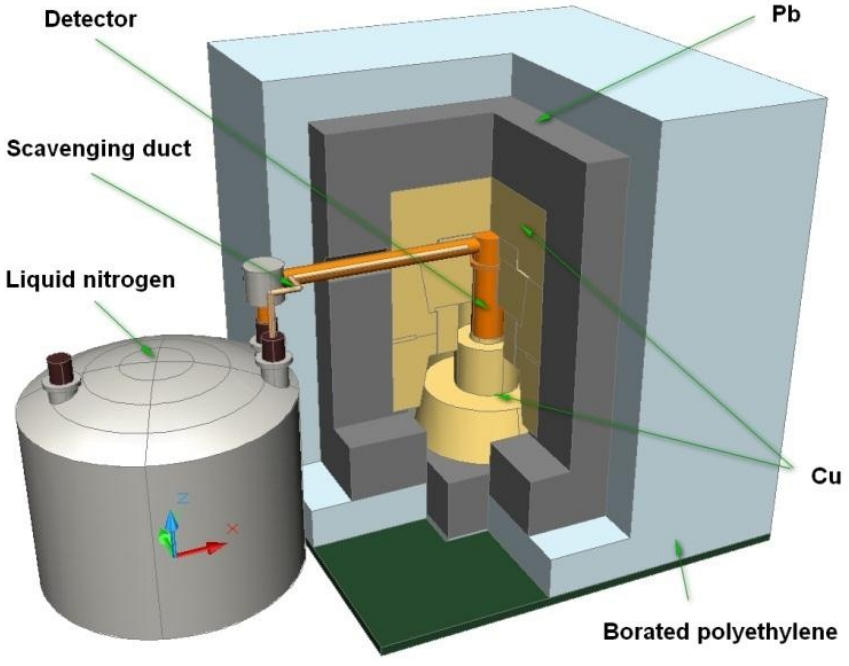
230 mm Pb

120 mm Cu



Detectors «1» and «2» are made of high-purity germanium, enriched by ^{76}Ge isotope to 87%, detector «3» is made of natural content, high-purity germanium (7,76% of ^{76}Ge, effective mass of det.№3 is 980 g).

Low background germanium gamma-spectrometer «SNEG» (“СНЕГ”)



Passive shield:

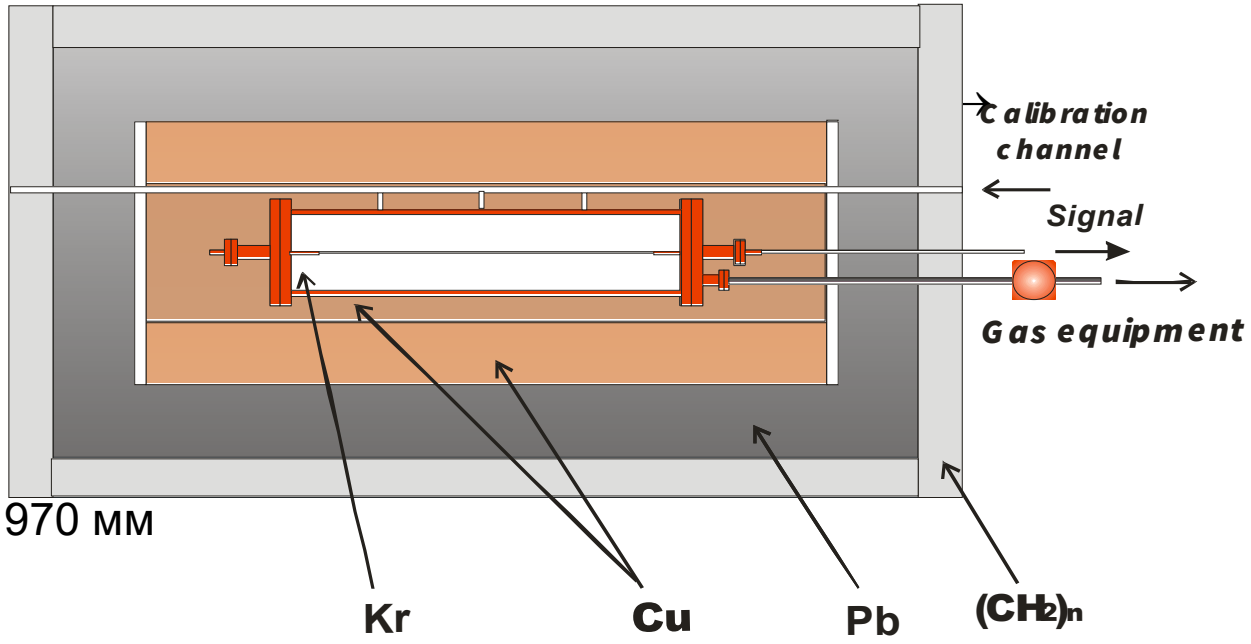
80 mm borated polyethylene

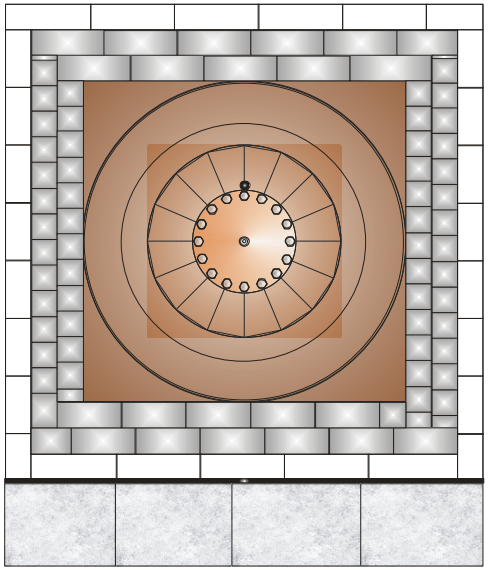
1 mm Cd

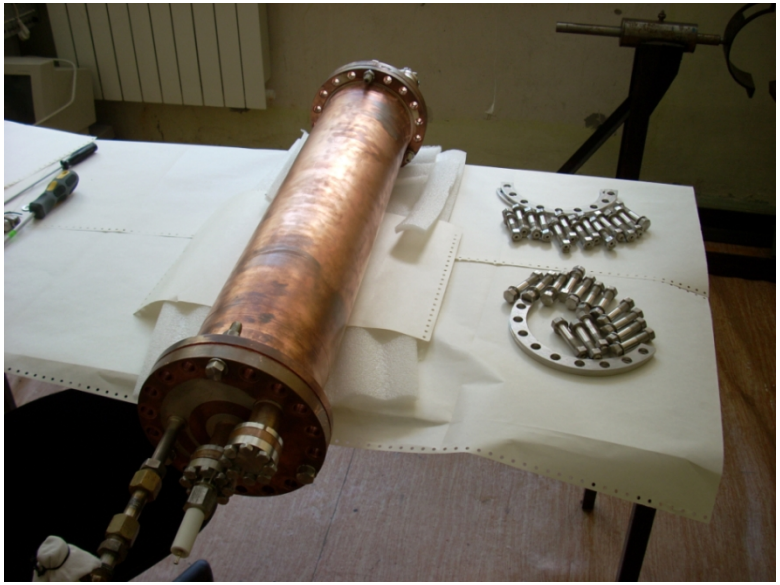
150 mm Pb

180 mm Cu

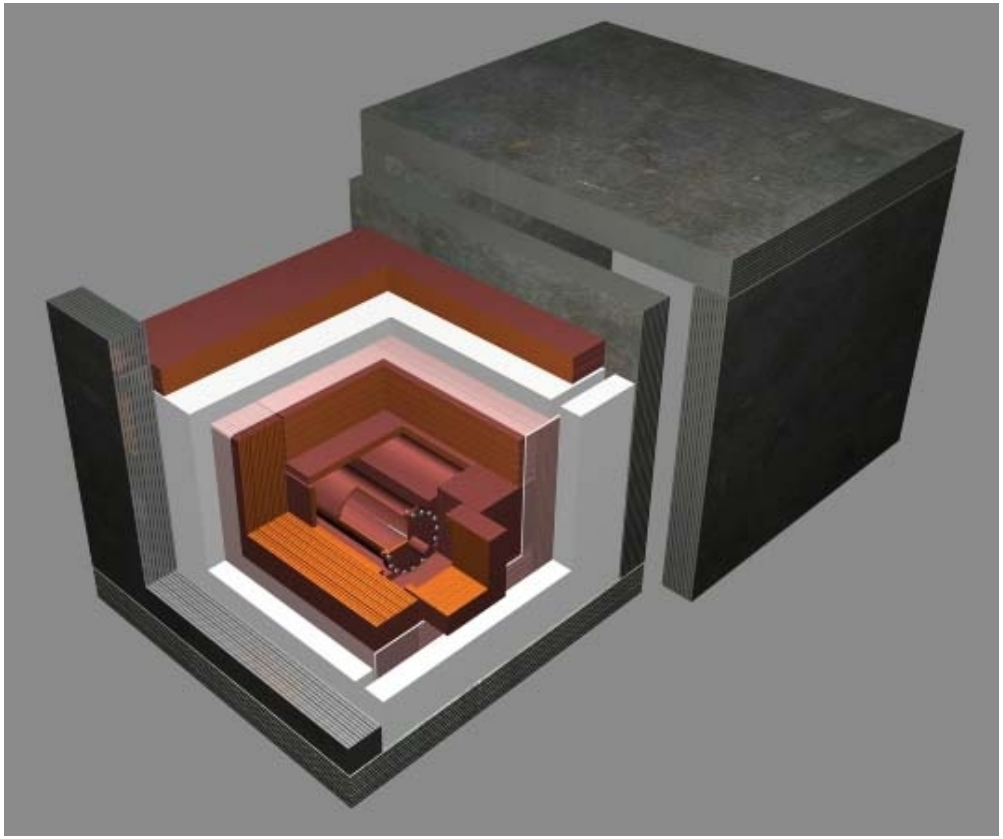
Search for 2K-capture of Xe-124







Search for solar axions



Detector	proportional counter
Passive shield	23cm Pb, 8cm PolyEth, 20cm Cu
Inner diameter	134 mm
⌀ of the anode wire	10 μm
Fiducial length	595 mm

International collaborations:

GERDA — search for neutrinoless double beta decay of ^{76}Ge

AMORE — search for neutrinoless double beta decay of ^{100}Mo