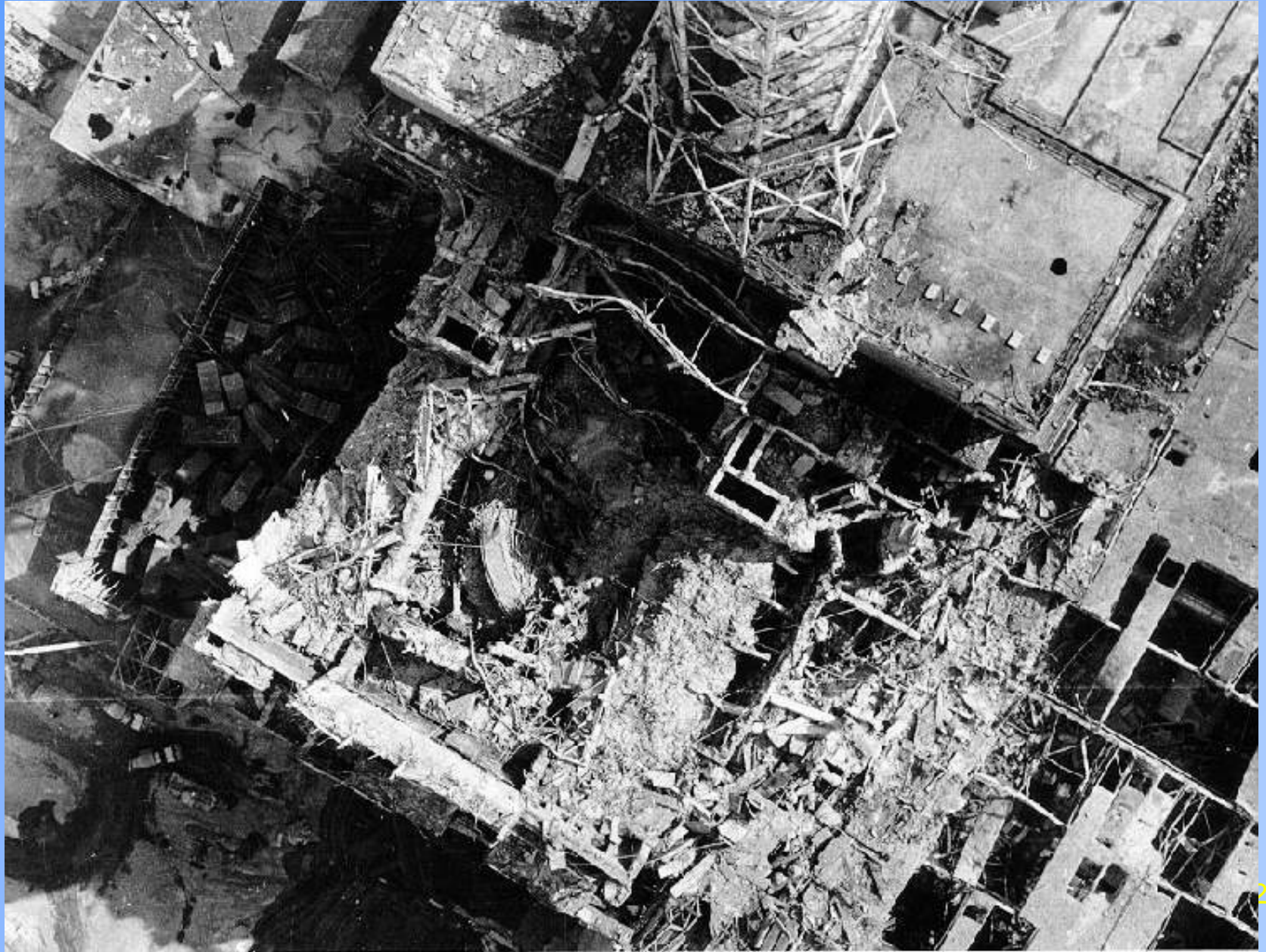


Status of the STCU project #3511 on “Development of device and method for gamma-radiation angular distributions measurement under hard radiation conditions ”

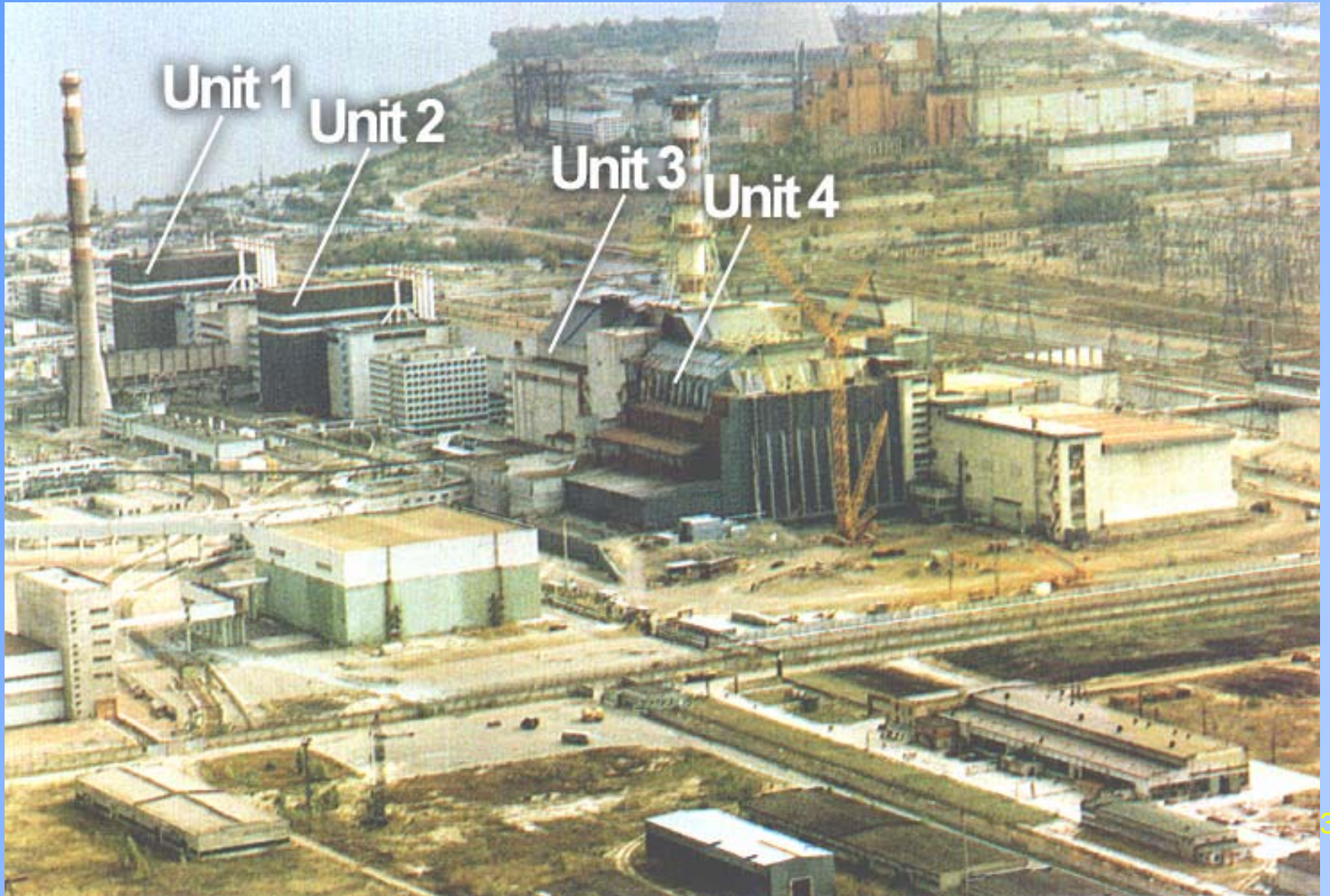
M. Khazhmuradov ,
National Science Center “Kharkiv Institute of Physics and
Technology”(NSC KIPT), Kharkiv, Ukraine

V. Batiy
Institute for Safety Problems of Nuclear Power Plants(ISF NPP),
Chornobyl, Ukraine

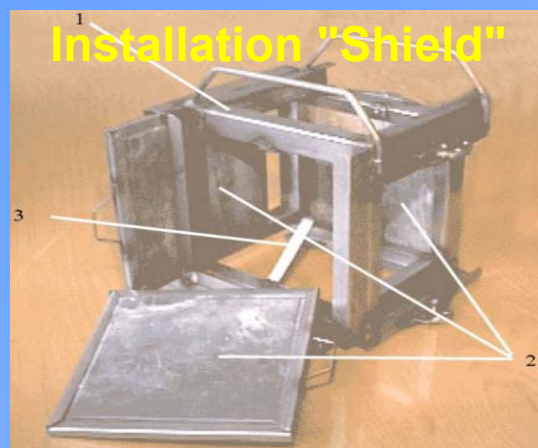
The destroyed Unit-4 after accident



Chornobyl NPP at last phase of “Shelter” erection



ISP NPP devices for “Shelter” gamma-fields investigations

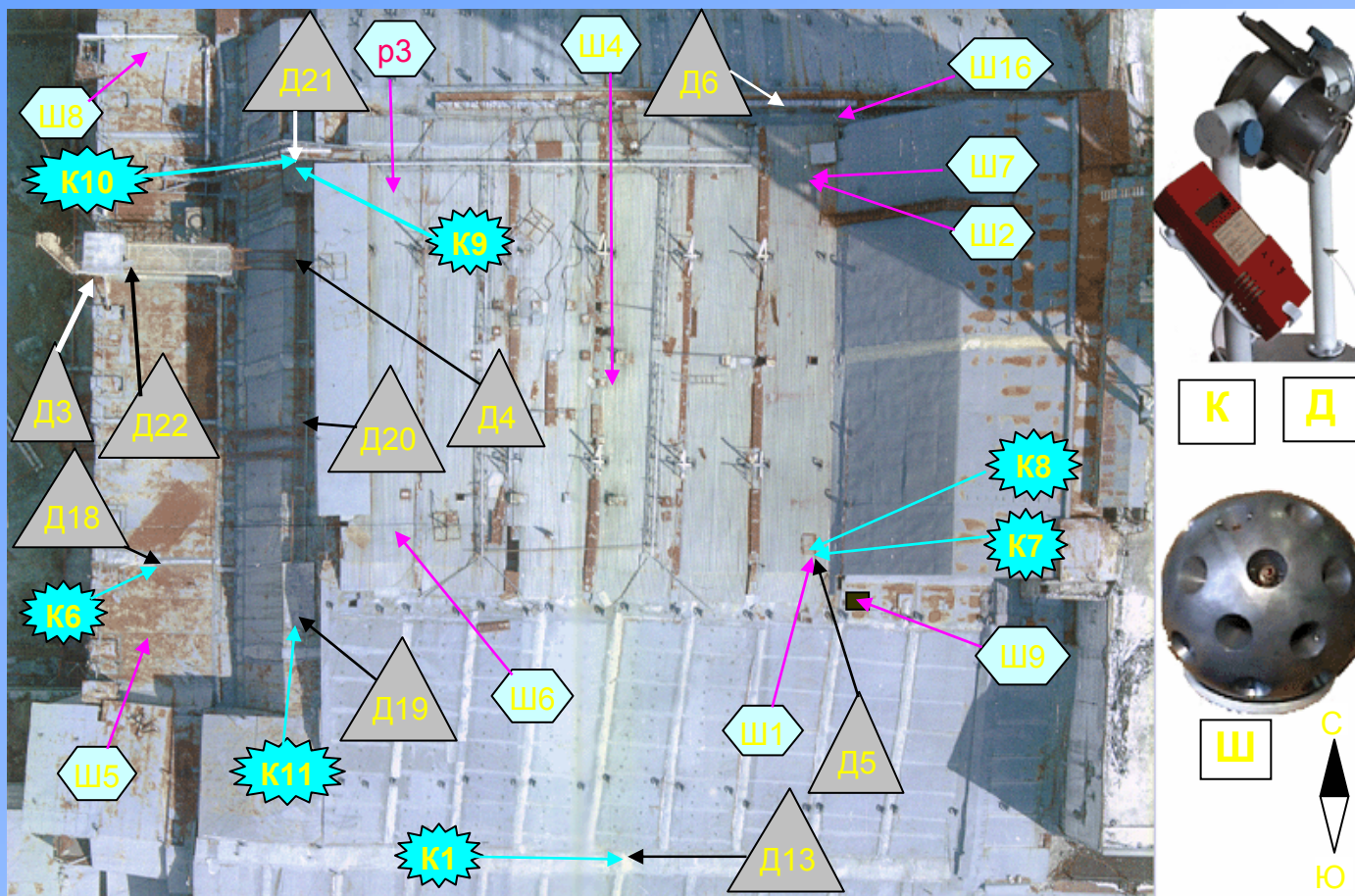


Series of collimated dosimeters

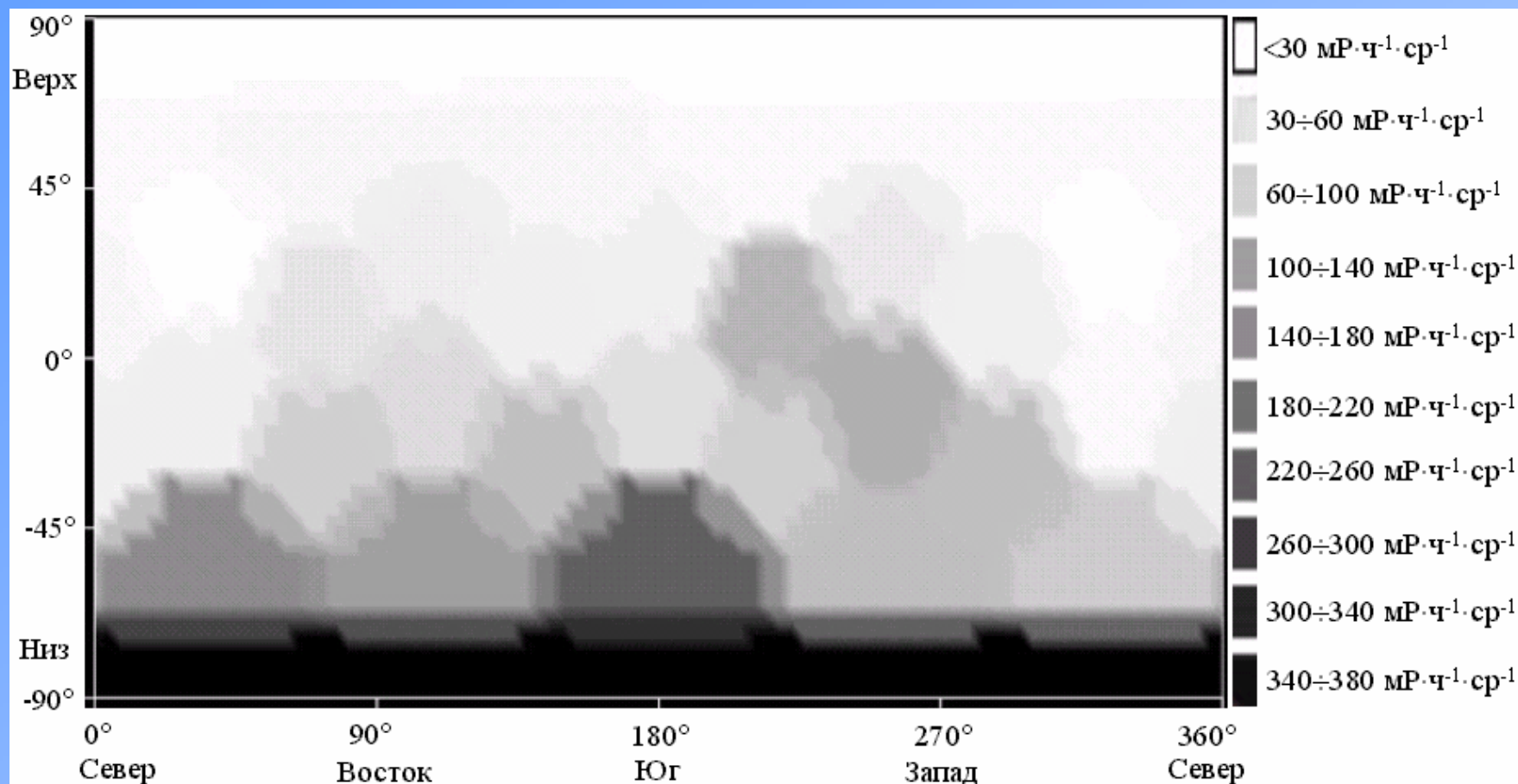
ShD-1 and ShD-2 devices



Places of measurements on “Shelter” roof



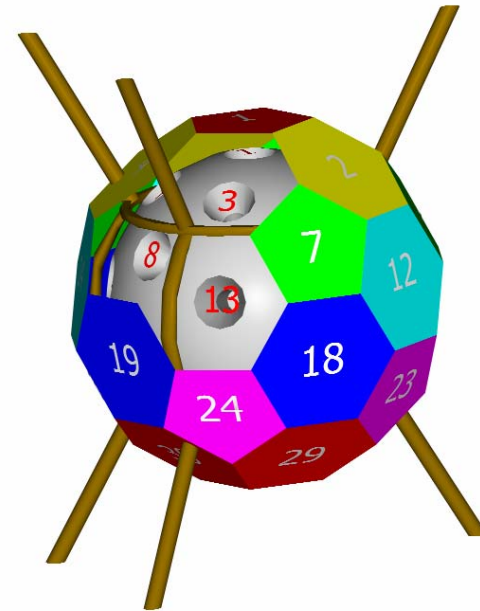
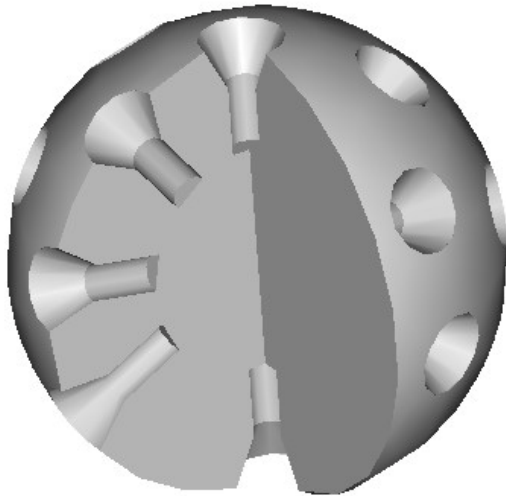
Cartogram of angular distribution on “Shelter” roof (p.3)



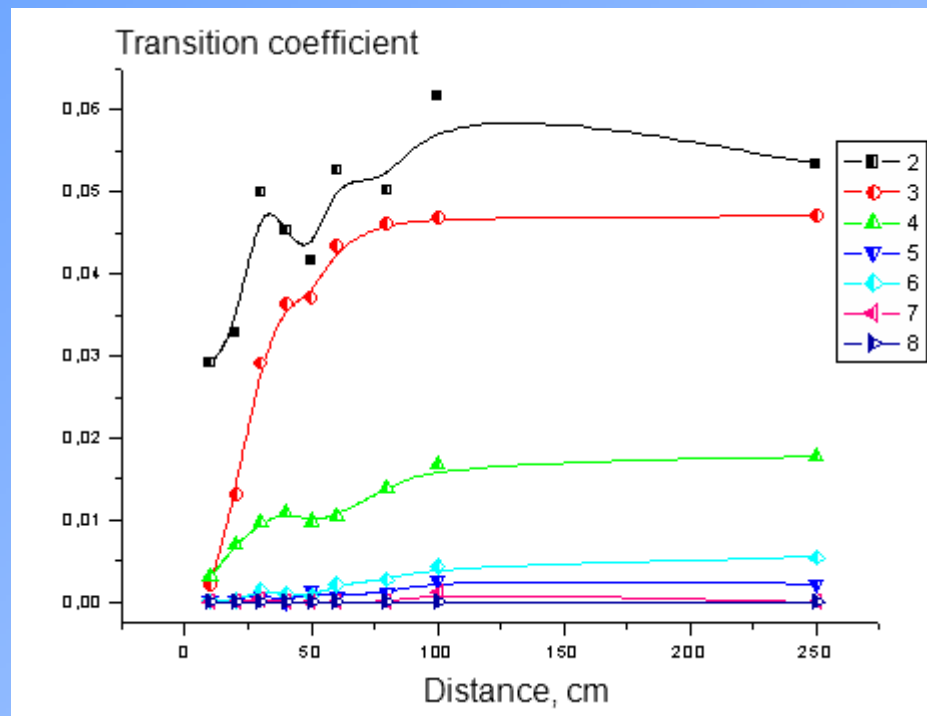
“Shelter” after strengthening it building constructions



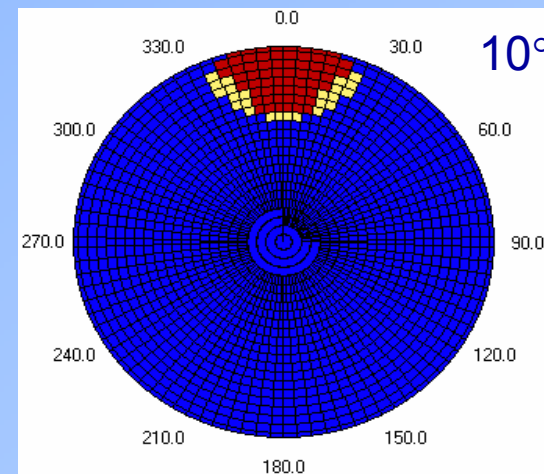
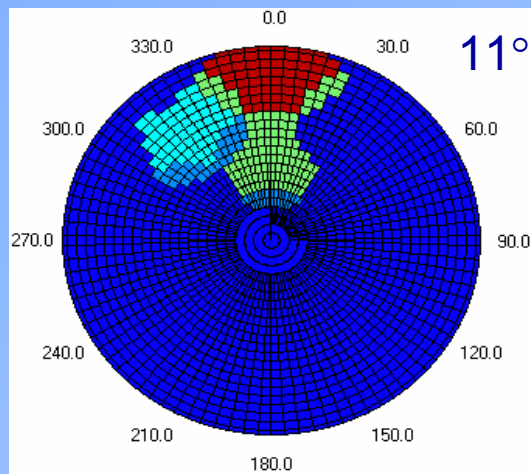
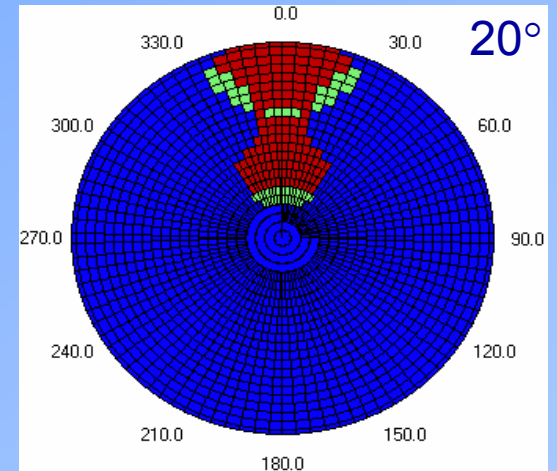
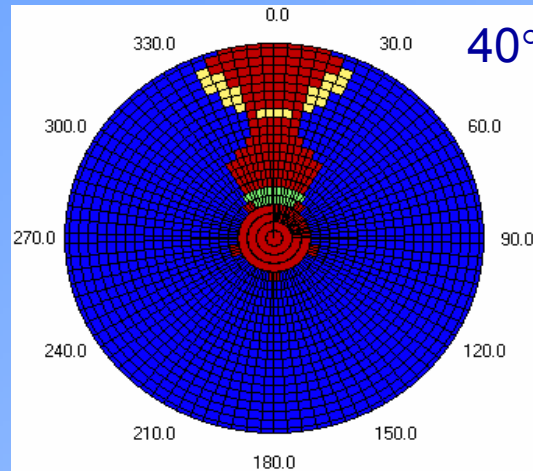
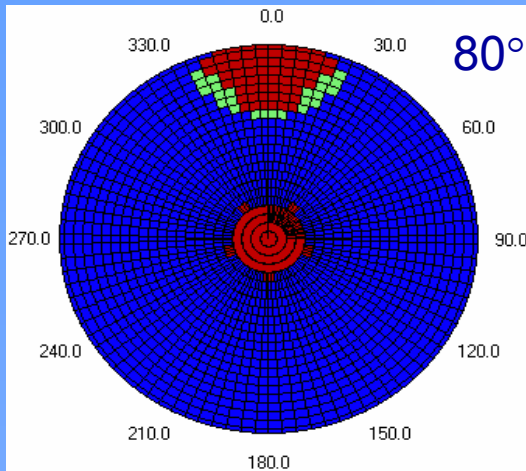
Computer model of ShD-3 device



Transition coefficient dependence on the distance from source to ShD 3 device for the various detector groups



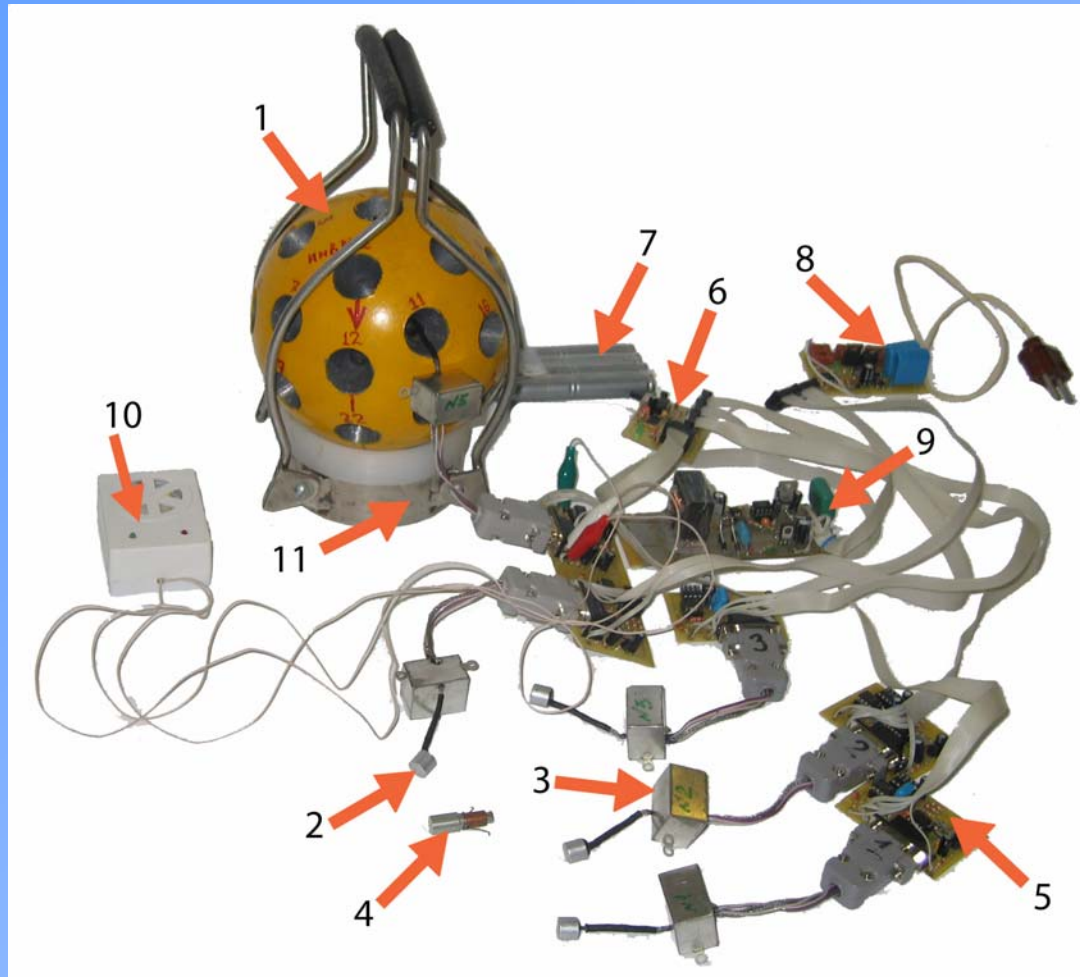
The results of simulation for two sources



Model of detector unit and template for marking of the collimator deepeningings

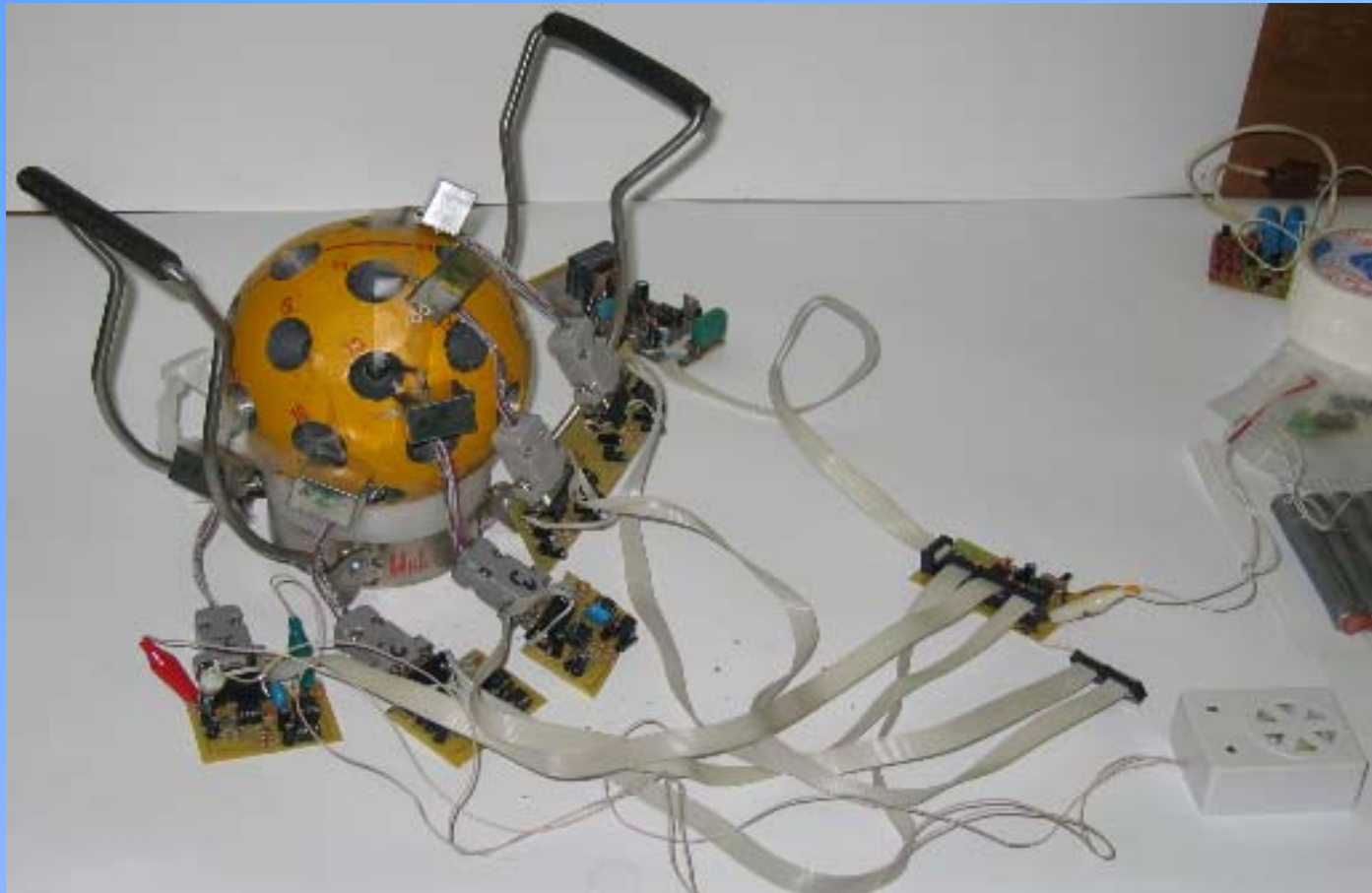


ShD-3 experimental model components

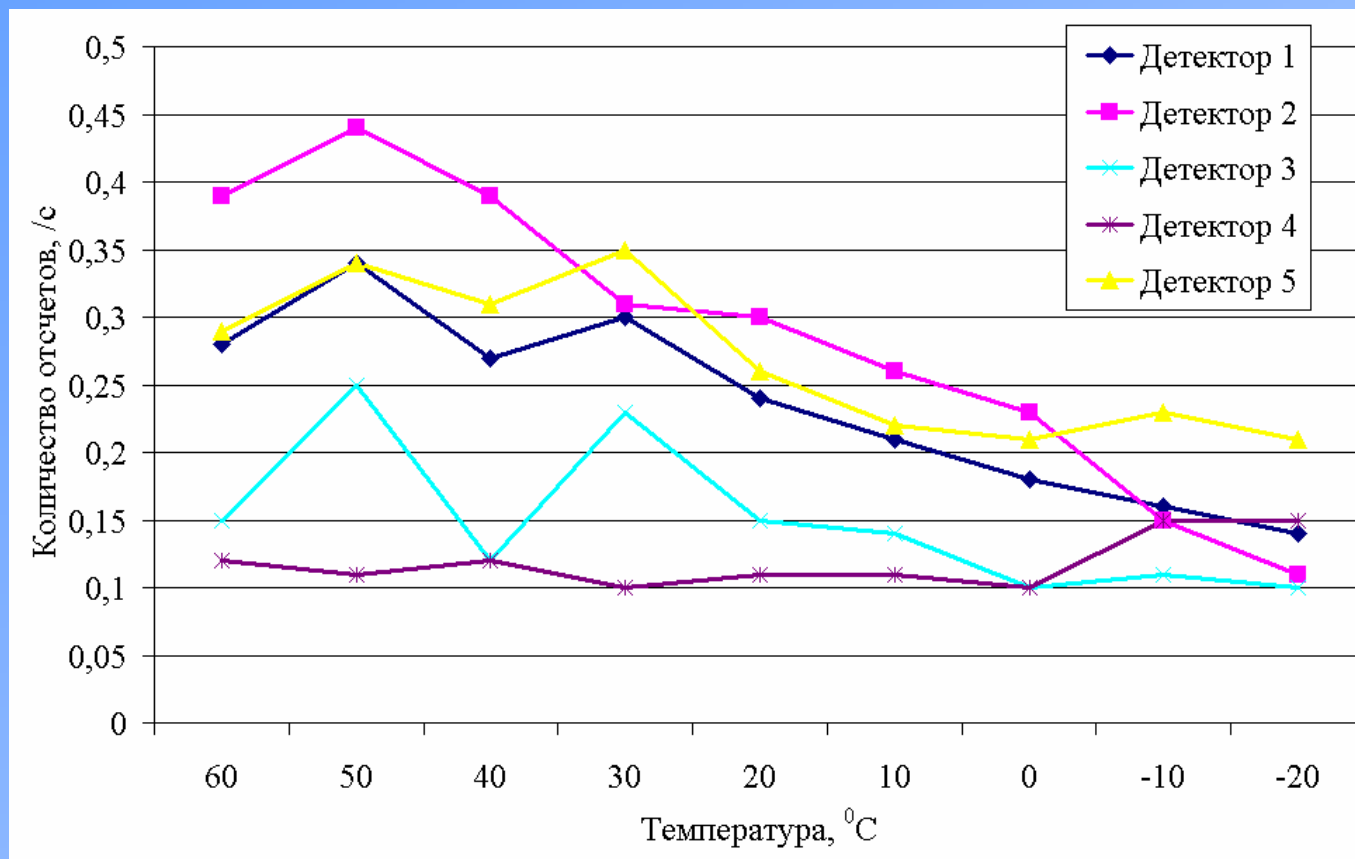


1 – lead detector unit with collimator deepings; 2 – CdZnTe detectors; 3 – preamplifier; 4 – capsule with TLD from ShD-1; 5 – block of preliminary processing; 6 – time generator; 7 – accumulator; 8 – charge battery device; 9 – high-voltage converter; 10 – indication block; 11 – prop

ShD-3 5 detector experimental model



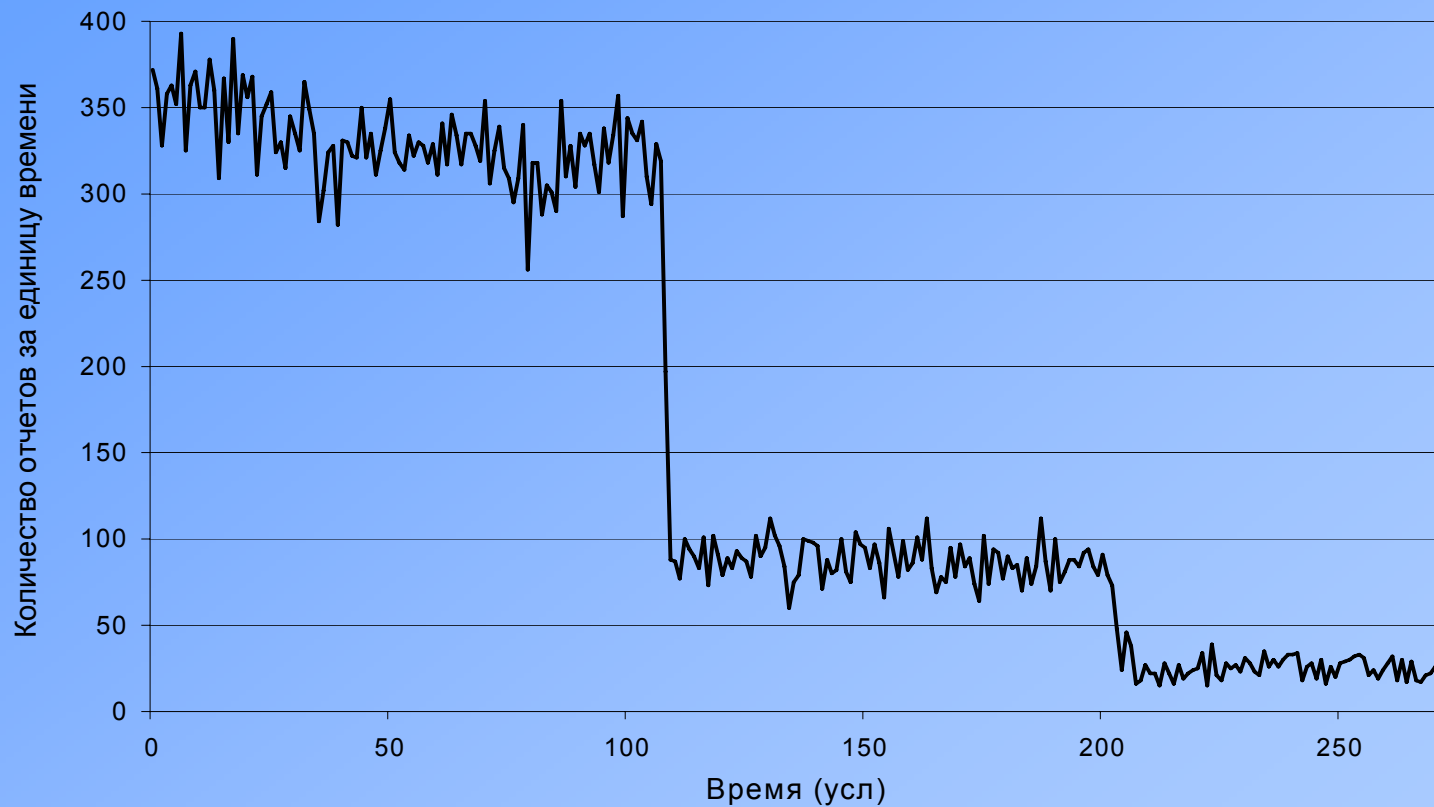
Temperature dependence of efficiency of different detectors



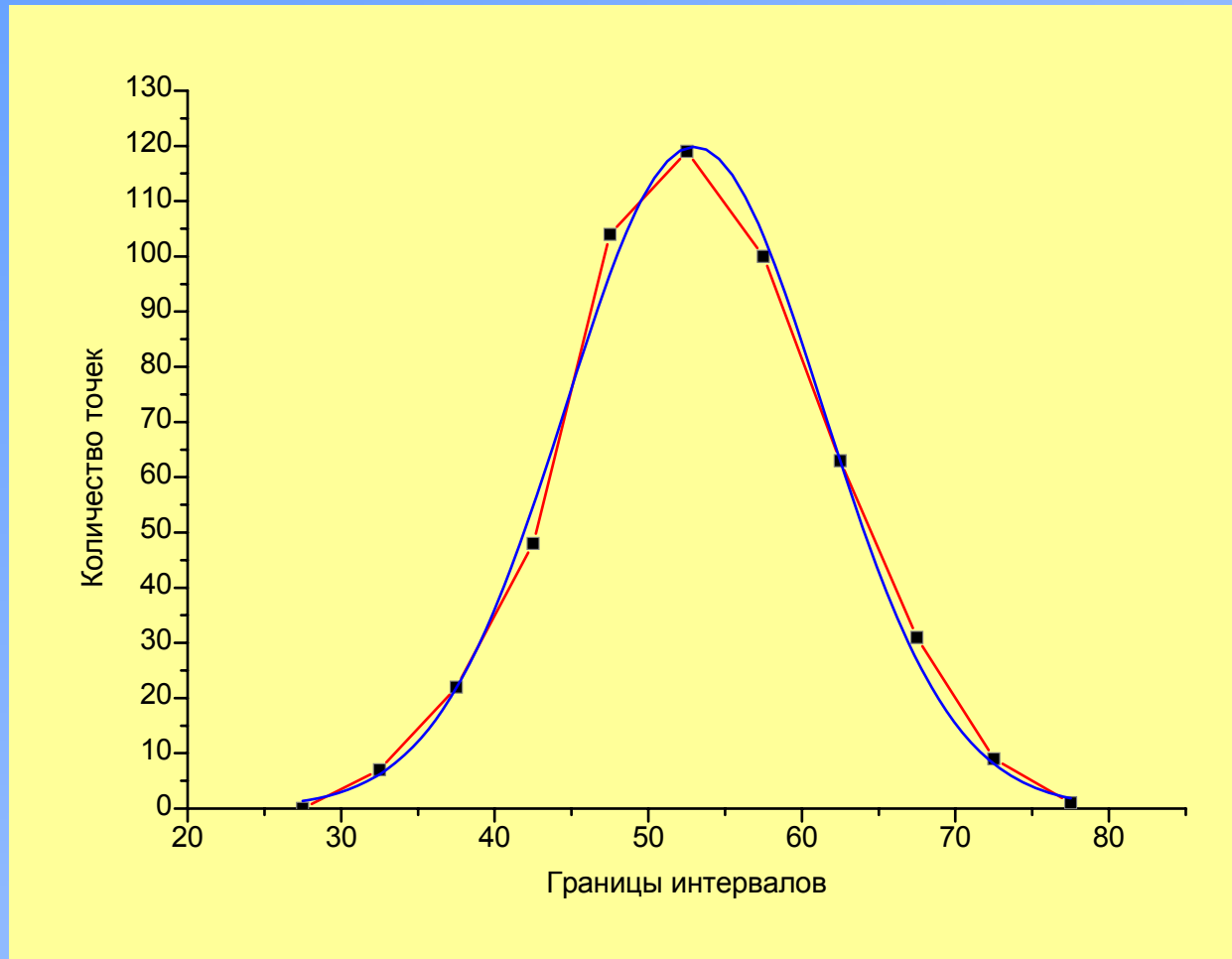
Cs-137 source with dose rate up to 200 rem/hour



Change of detector counting rate with change of distance from device to gamma source



Comparison of results of ShD-3 measurements (points) with normal distribution (smooth curve)

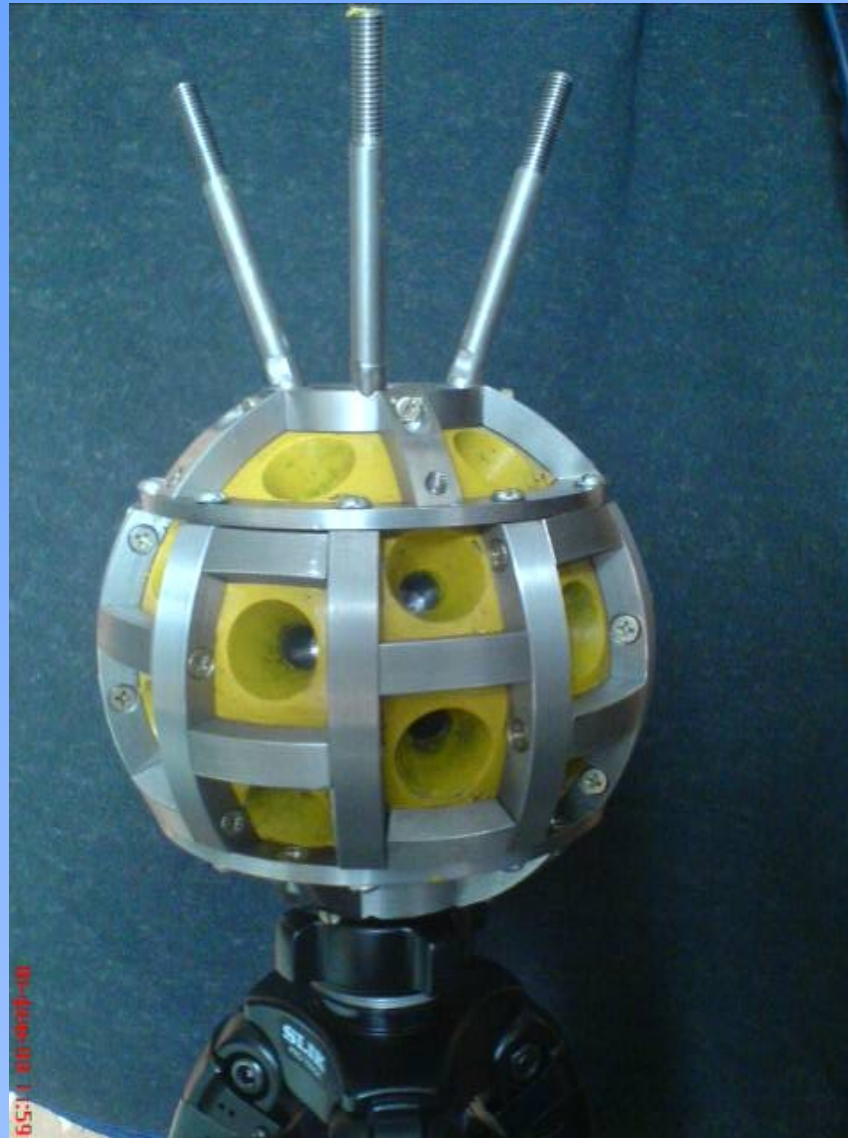


Detector unit with steel framework and legs



10-09-01 80-880-01

Detector unit at tripod



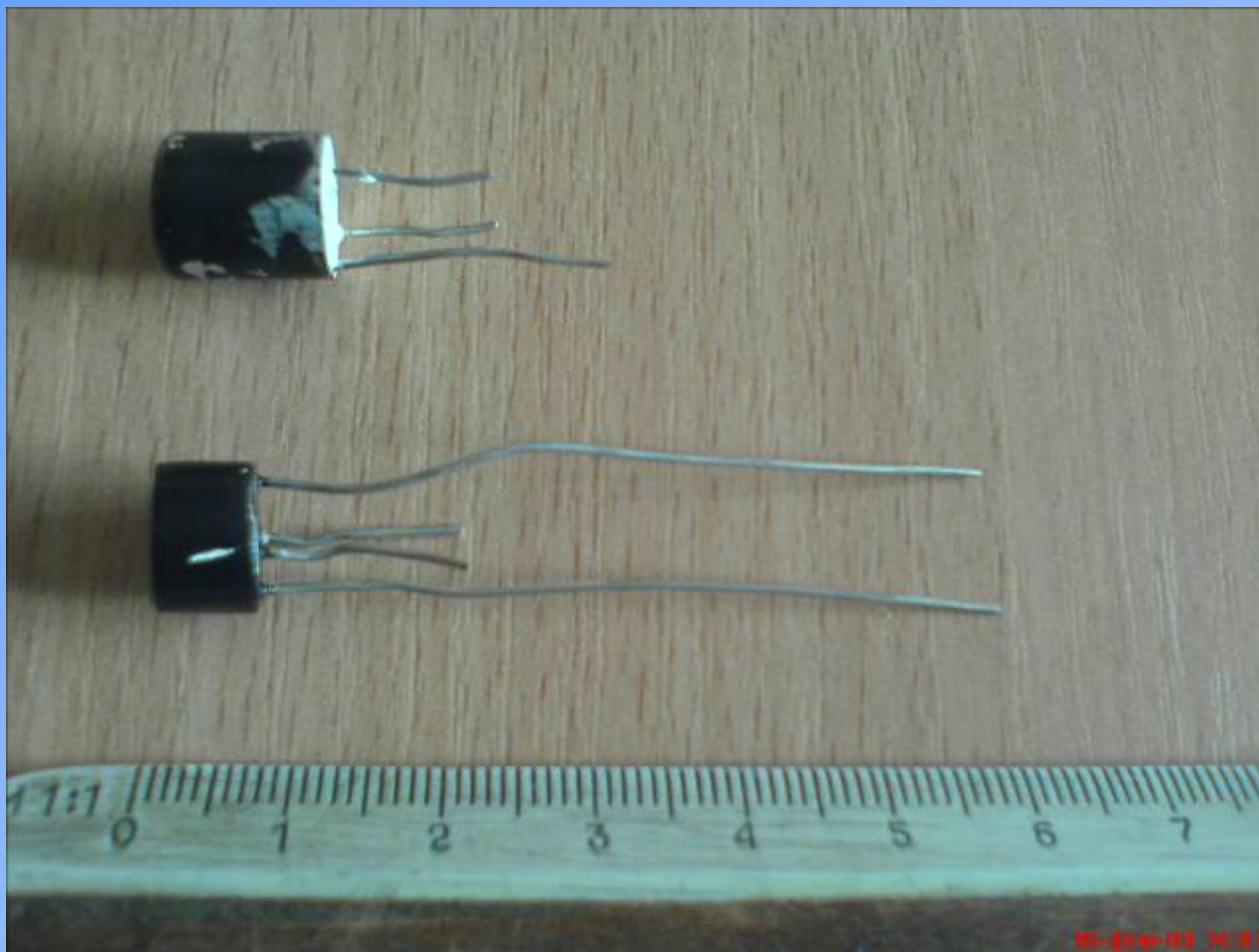
Detector unit with cells for electronic mounting



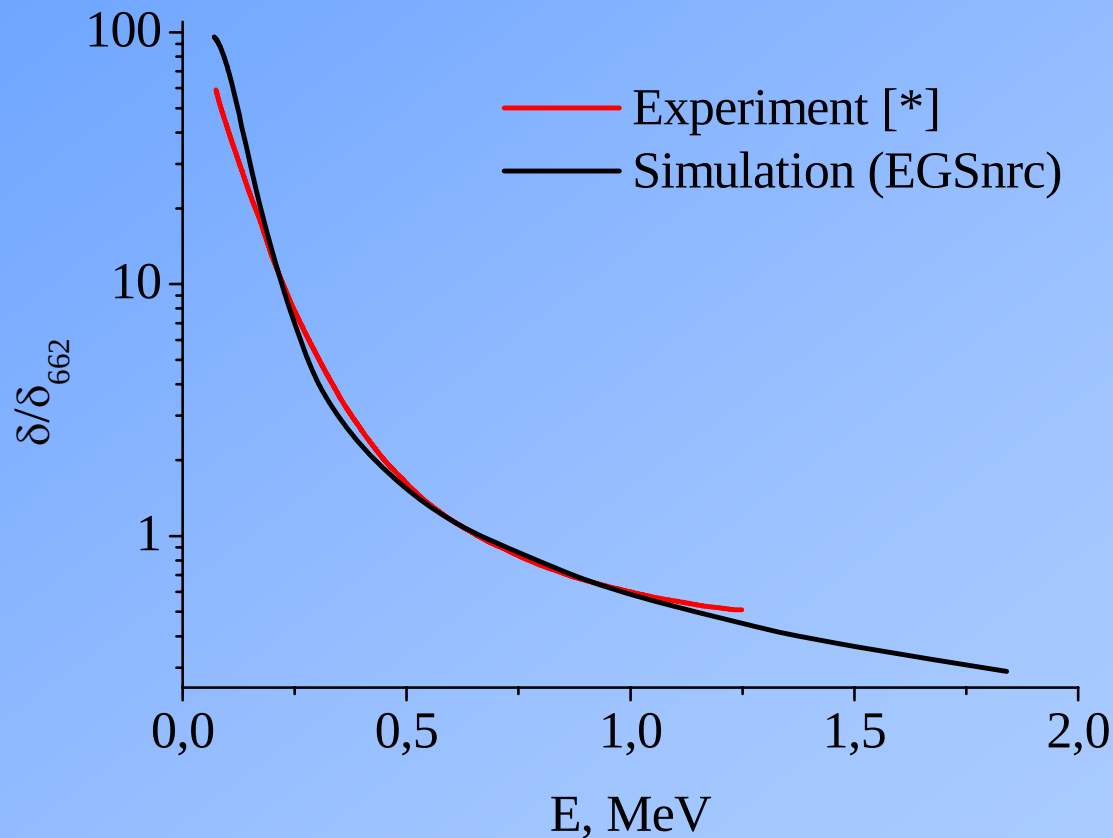
Electronics for one measurement channel



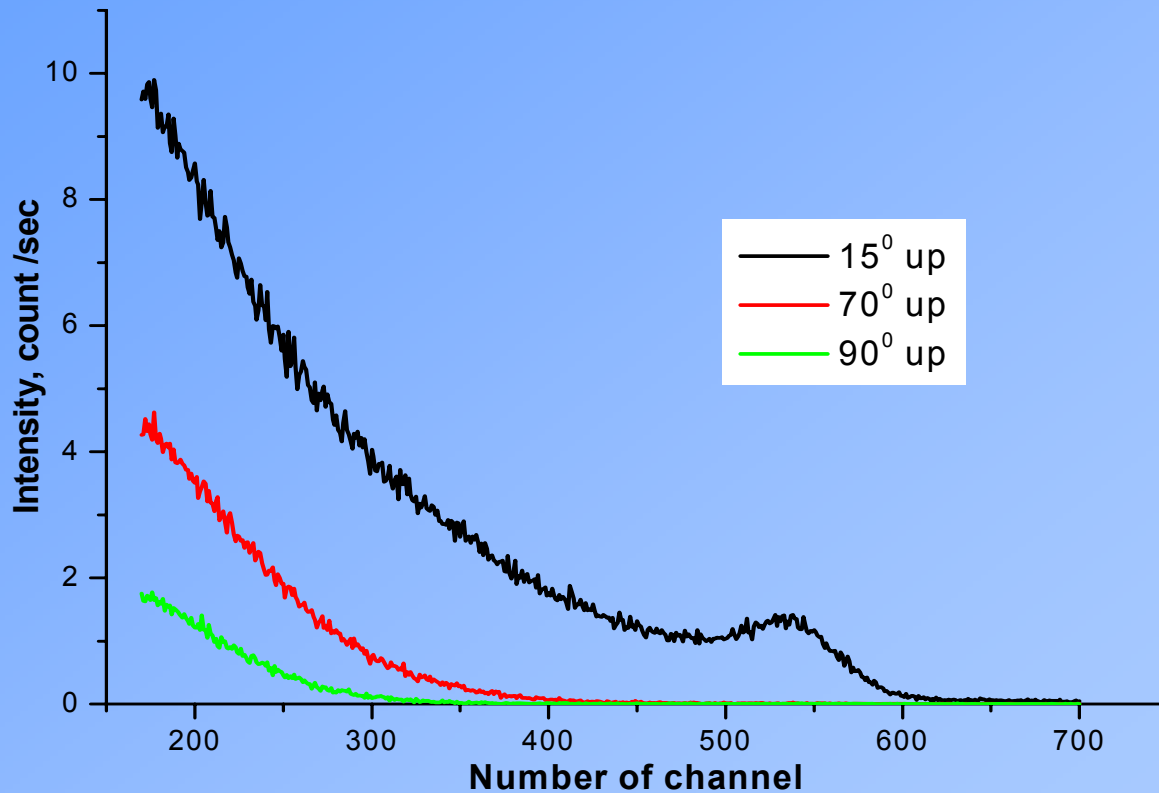
CdZnTe detectors



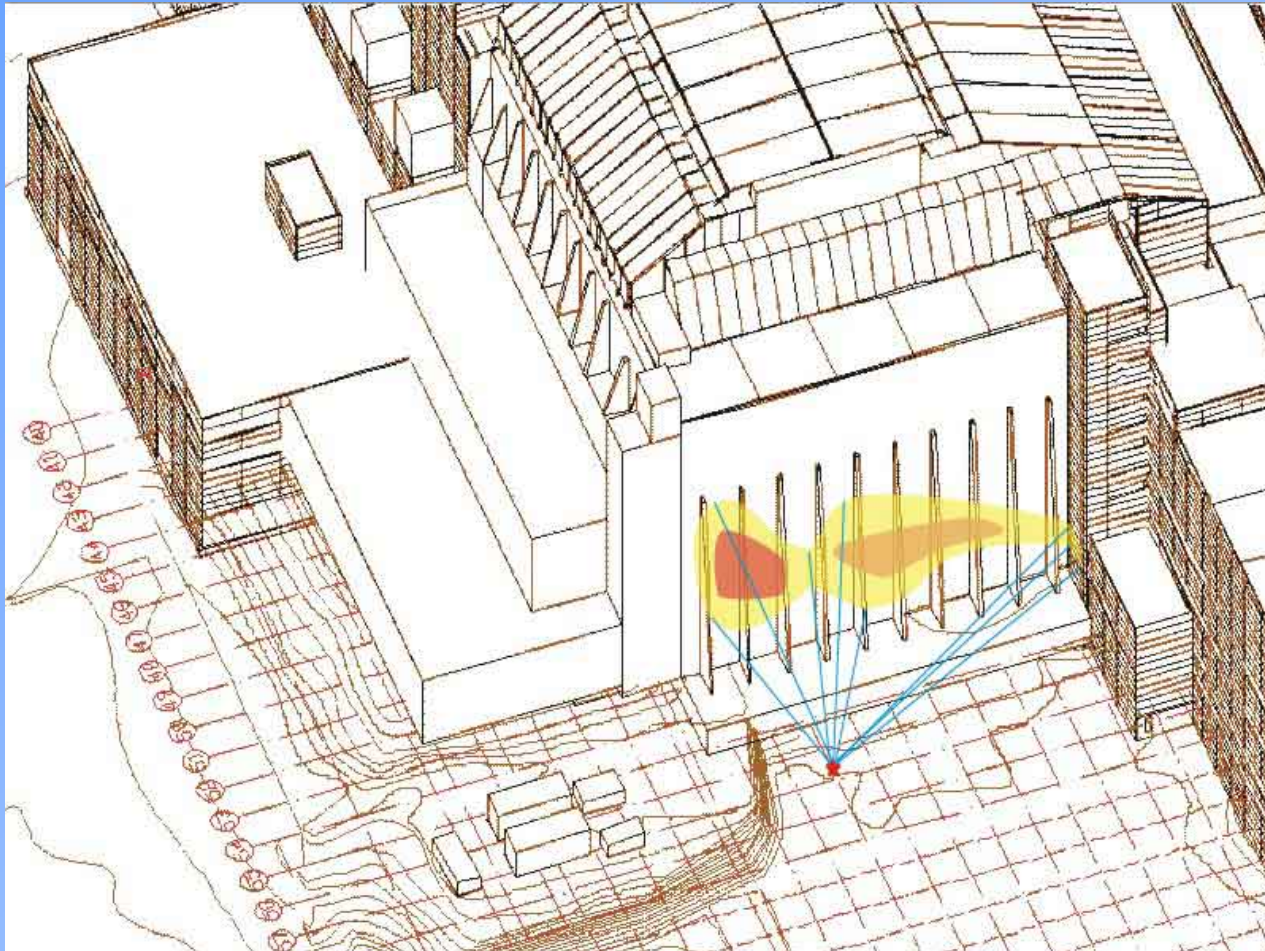
Energy dependence of CdZnTe – detector sensibility



Gamma spectra in the direction of “Shelter” under angles 15°, 70° and 90° upward



Simulation of main gamma-sources location



Main directions of method and device modernization

- 1. Gamma spectra measuring in all directions**
- 2. Development of the remote control system**
- 3. Development of telecommunication system**
- 4. Equipping device with modern facilities for affixment in-situ**
- 5. Equipping device with system of miniature gyroscopes**
- 6. Equipping of device with the system of video supervision**
- 7. Development of mathematical model for complex measuring results processing**
- 8. Improvement device construction and manufacturing technology**

Thank You

Questions?