

REXDAN Research Vessel

The Radiometry Laboratory

is dedicated to applications involving the use of different radiometric methods for the experimental in-situ determination of corpuscular (alpha and beta) and electromagnetic (gamma and X) radiation levels, the activity of natural and artificial radionuclides in the environment, the dose rate of nuclear radiations, environmental protection and radiation protection measurements, the measurement of contamination of bodies, objects and people, as well as the monitoring of controlled areas.

The **radiometry laboratory** includes portable equipment which can be used for:

- determination of ambient dose rate of gamma, X, alpha and beta radiations;
- measurement of radioactive activity of radioisotopes in different environmental compartments;
- measurement of gross alpha and gross beta activity;
- measurement of radioactive contamination of the environment.

Members:

Prof.dr. habil. Antoaneta ENE - <https://scholar.google.com/citations?hl=en&user=RSsoZyUAAAAJ>

The Radiometry Laboratory

Equipment:

Area dosimeter RADEYE G20-10 with accessories, Thermo Fisher Scientific

Uses:

- determination of ambient dose rate of gamma and X radiation;
- up to 2000 data can be recorded and easily transferred to a computer.

Technical specifications:

- gamma and X-area radiation flow-dosimeter, with warning for exceeding the dose rate and dose limit;
- energy response range: 17 keV–3 MeV;
- minimum equipment detection limit: 0.01 $\mu\text{Sv/h}$ for dose rate equivalent;
- settable alarm thresholds for doses and dose rates, with optical, acoustic and vibration alarms;
- equipped with carrying case, RadEye operating software stick and interface for computer connection and data transfer.



The Radiometry Laboratory

Equipment:

Contaminometer RADEYE B20-ER with accessories, ThermoFisher Scientific

Uses:

- measurement of alpha, beta, gamma and X radiations, the instrument being used both in alpha-beta contaminometer mode, including alpha radiation discrimination, to measure unfixed contamination, and as flow meter or area/ambient dosimeter, for measuring dose rates and equivalent ambient doses.

Technical specifications:

- multiple, user-selectable operating modes (scaler/timer, numerator, dosimeter, contaminatometer, identifier), displaying different units of measurement: cps, cpm, Bq, dpm, Sv/h and submultiples, Sv and submultiples, rem/h, Bq/cm²;
- the energy range for gamma radiation is 17 keV–3 MeV;
- contamination measurement range: 0–500 kcps;
- gamma dose rate range: 0,2 µSv/h–100 mSv/h [20 µrem/h – 10 rem/h];



The Radiometry Laboratory

Equipment:

Contaminometer RADEYE B20-ER with accessories, ThermoFisher Scientific

Technical specifications:

- relative detection efficiency in 2π geometry: Am-241:28%, Co-60:25%, Sr/Y-90:36%, C-14:19%;
- includes the list of radionuclides in the contaminometer operating mode;
- illuminated LCD screen for operating mode, alarm threshold values, operating data;
- settable alarm thresholds for doses and dose rates, with optical, acoustic and vibration alarms;
- using filter H*(10) you can set the operating mode as flow meter or area dosimeter;
- equipped with transport and storage cassette, case, software and interface for computer connection and data transfer.



The Radiometry Laboratory

Equipment:

Portable system for alpha and beta determinations RADEYE HEC+ with accessories, ThermoFisher Scientific

Uses:

- monitoring exposure to global alpha and beta radiations, (provided with a manual system for handling measurement samples, with tray, which allows adaptation of different types of samples).

Technical specifications:

- the radioactive background is ≤ 1 cps for beta channel or electronic capture (EC) at 100 nSv/h background and ≤ 0.05 cps for alpha channel at 100 nSv/h (10 μ R/h) background;
- the detection efficiency/sensitivity in geometry 2π is: i) for alpha radiation: Am-241: 70%, ii) for beta radiation: Sr/Y-90: 65%, Tc-99: 45%, C-14: 20%;



The Radiometry Laboratory

Equipment:

Portable system for alpha and beta determinations RADEYE HEC+ with accessories, ThermoFisher Scientific

Technical specifications:

- digital electronics, with internal memory for 4500 measured values and 250 configuration, calibration and alarm data;
- includes a list of radionuclides of interest;
- operating conditions: temperature between -20°C and $+50^{\circ}\text{C}$; maximum relative humidity of 95%, non-condensable;
- multiple units of measurement: cps, cpm, Bq, Bq/cm, dps, dpm;
- battery power supply with long autonomy/operating time (over 800 hours), and/ or AC power supply 100-240 V and 47-63 Hz;
- selectable measurement time in the range 1-9999 s;
- alarms for counting rate, decalibration, exceeded levels/overcounting;
- It is equipped with a set of 50 work/sample measuring trays, transport and storage cassette for field activities, power cable, software and interface for computer connection and data transfer.

