^{137}Cs INVENTORY IN SOUTH ADRIATIC

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1. INTRODUCTION

Radioecological monitoring in the Adriatic Sea water, especially on the Eastern coast, started in early 1960s and take significant part in an extended and still ongoing monitoring program of radioactive contamination of human environment in Croatia.

In this poster are presented results of investigation of ^{137}Cs activity concentrations and sediments in South Adriatic. Inventory of ^{137}Cs in sediments and sea water is estimated.

Sediment samples were collected during radioecological cruise organized by International Atomic Energy Agency in year 2007, while sea water samples were collected on yearly basis as a part of extended monitoring program of the radioactive contamination of Croatian environment.

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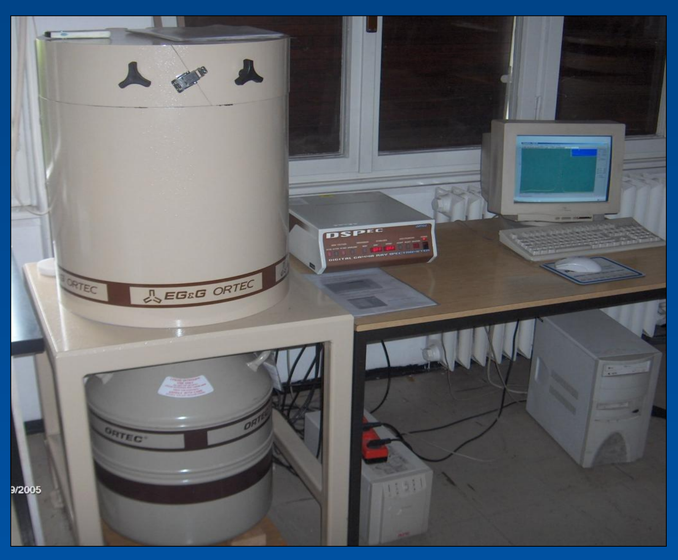

Fig. 2. Gamma ray spectrometry system

2. MATERIALS AND METHODS

A gamma ray spectrometry system, based on a High-Purity Germanium Coaxial Photon Detector System ORTEC HPGe detector (FWHM 2.24 keV at 1.33 MeV ^{60}Co and relative efficiency of 74.2% at 1.33 MeV), coupled to a computerized data acquisition system was used to analyze collected samples.

The detector was shielded by 10 cm thick led well internally lined with 2 mm copper and 2 mm cadmium foils. Energy and efficiency calibration of the gamma spectrometer were carried out using calibration sources supplied by Czech Metrological Institute covering energy range between 80 and 2500 keV.

Quality assurance and intercalibration measurements were conducted throughout participation in international intercalibration programs organized by International Atomic Energy Agency (IAEA), World Health Organization (WHO) and Joint Research Centre (JRC). The testing method is accredited by Croatian Accreditation Agency according to the ISO Norm 17025.

3. RESULTS

Total inventory of ^{137}Cs in sea sediments in south Adriatic, which has area of about 60,000 km^2, has been estimated to be 2.32 E+15 Bq.

Total inventory of ^{137}Cs in sea water in south Adriatic, which has volume of about 28172 km^3, has been estimated to be (8.51 0.24) E+13 Bq

The highest value of ^{137}Cs activity concentration has been found on sampling location in Albania (1.24 E+5 Bqm^{-2}) while, for comparison, ^{137}Cs activity concentration on location Jabuka in middle Adriatic was found to be 5.79 E+4 Bqm^{-2}.

Location	Activity concentration ($Bq\ m^{-2}$)
SA PIT 1	3.78E+04
SA PIT 2	4.57E+04
Jabuka	5.79E+04
Albania	1.24E+05
Palagruža	3.26E+04
Mean value	(3.87 0.66) E+4

Table 1. Activity concentrations in sediments

4. CONCLUSIONS

- ^{137}Cs in the Adriatic Sea sediments mainly originated from fallout with significant contribution of runoff visible only on sampling site in Albania
- In undisturbed sediments collected in South Adriatic Pit, the deepest part of the Adriatic Sea could be distinguished two ^{137}Cs peaks, one from 1960s, i.e. from the period of intensive atmospheric nuclear tests and the Chornobyl peak
- Regarding radioactive contamination by fission products, the Adriatic Sea is unpolluted
- Investigations of ^{137}Cs activity concentrations in Adriatic marine environment is important part of overall monitoring programme and is conducted in accordance with European Commission Recommendation of June 8, 2000.