

# Gamma spectrometry studies of tap water from Greece

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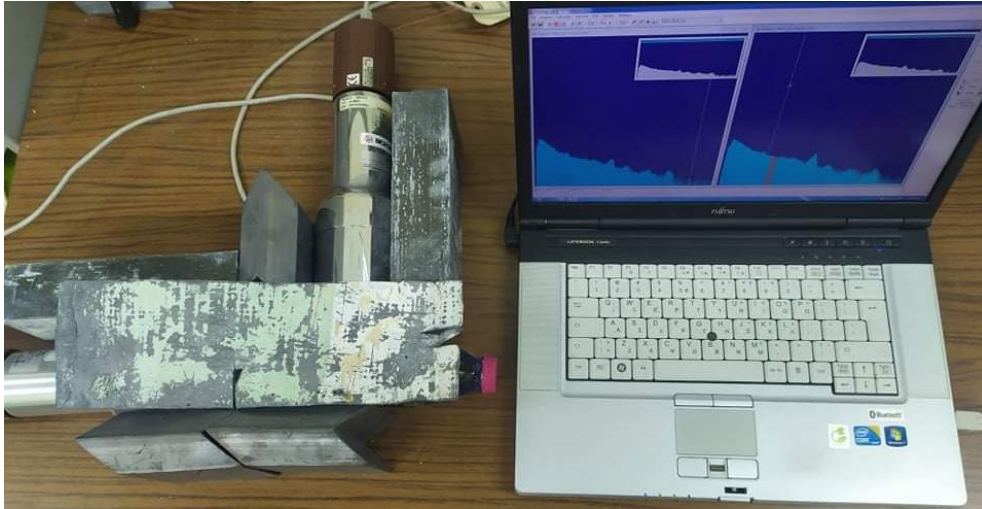
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# Introduction

Natural radioactivity levels in water have been a major objective in various studies worldwide. Besides water resources in the natural environment, it is also important to study processed water that is aimed for consumption by human population in terms of natural or artificial radioisotopes concentrations.

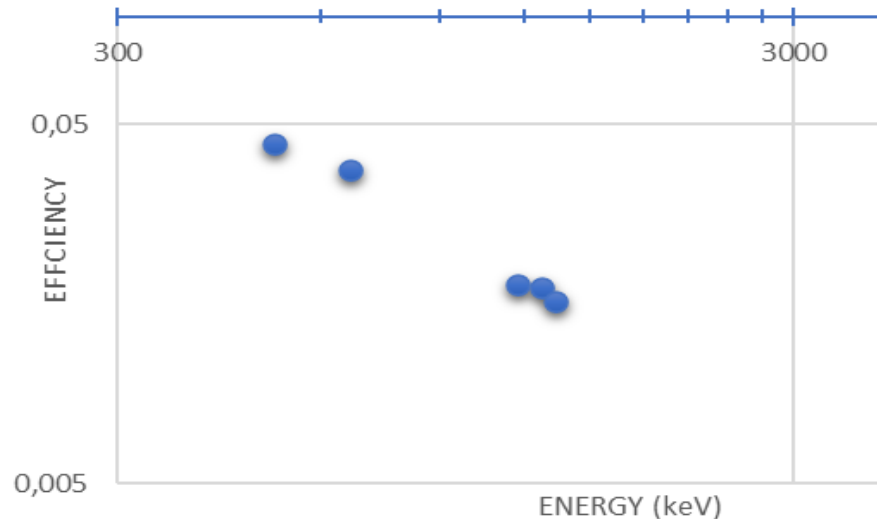
# The $\gamma$ -spectrometry setup



- We used two 3" x 3" NaI(Tl) detectors
- 73 samples 0.5L of tap water from various locations in Greece

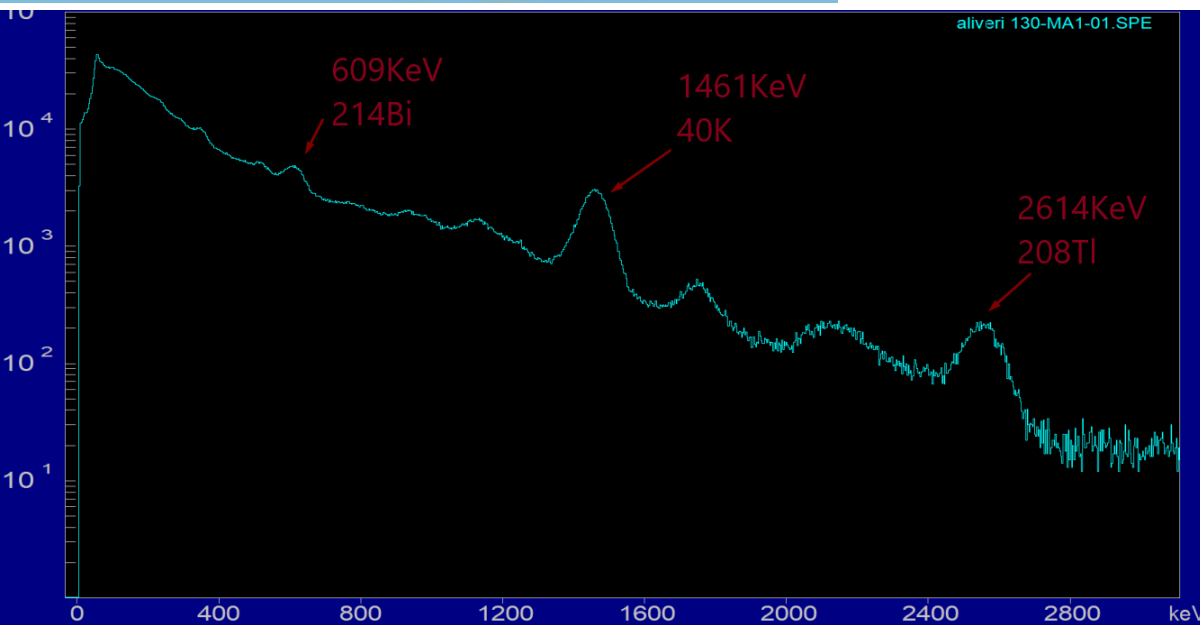
The spectrometers were calibrated using standard point sources and their absolute efficiency was determined.

Efficiency curve



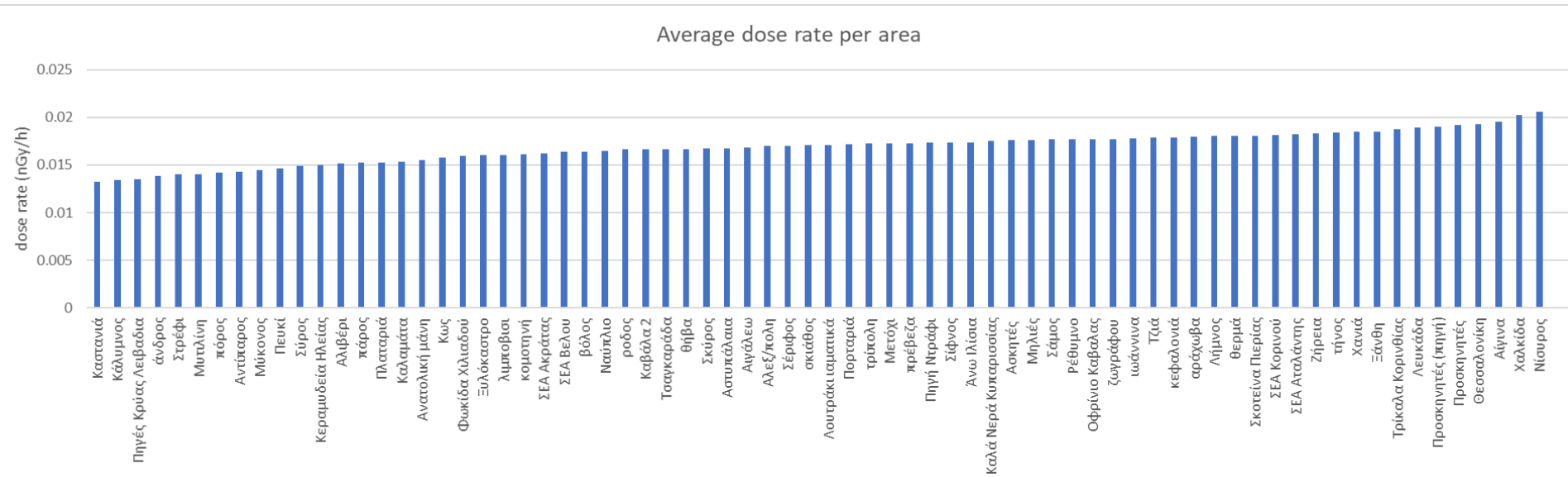
# Data analysis

- We examine the radiation levels of naturally occurring isotopes (U-series, Th-Series,  $^{40}\text{K}$ ) from various locations around Greece (see map).
- Using the UNSCEAR model, dose rates were calculated further to examine the variation of the received dose from drinkable water, received by the general population.



A typical spectrum as seen in the SPECTRW software.

# Results-Conclusions



- All dose rates seem to be near the natural background dose rate of Greece.
- Despite variations, a rather distinct uniformity has been observed countrywide, attributed possible to the standards applied by state authorities during water transfer, storage, disinfection and distribution.

In future work we will:

- partition Greek areas based on geological features
- examine correlations for locations with particular features  
e.g. mineral springs
- Measure samples from Western/Northwestern Greece

## Acknowledgments

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- Dr. C.Kalfas for SPECTRW licenses