Estimation of masses of radioactive elements in geological samples using R programming language and ROOT libraries

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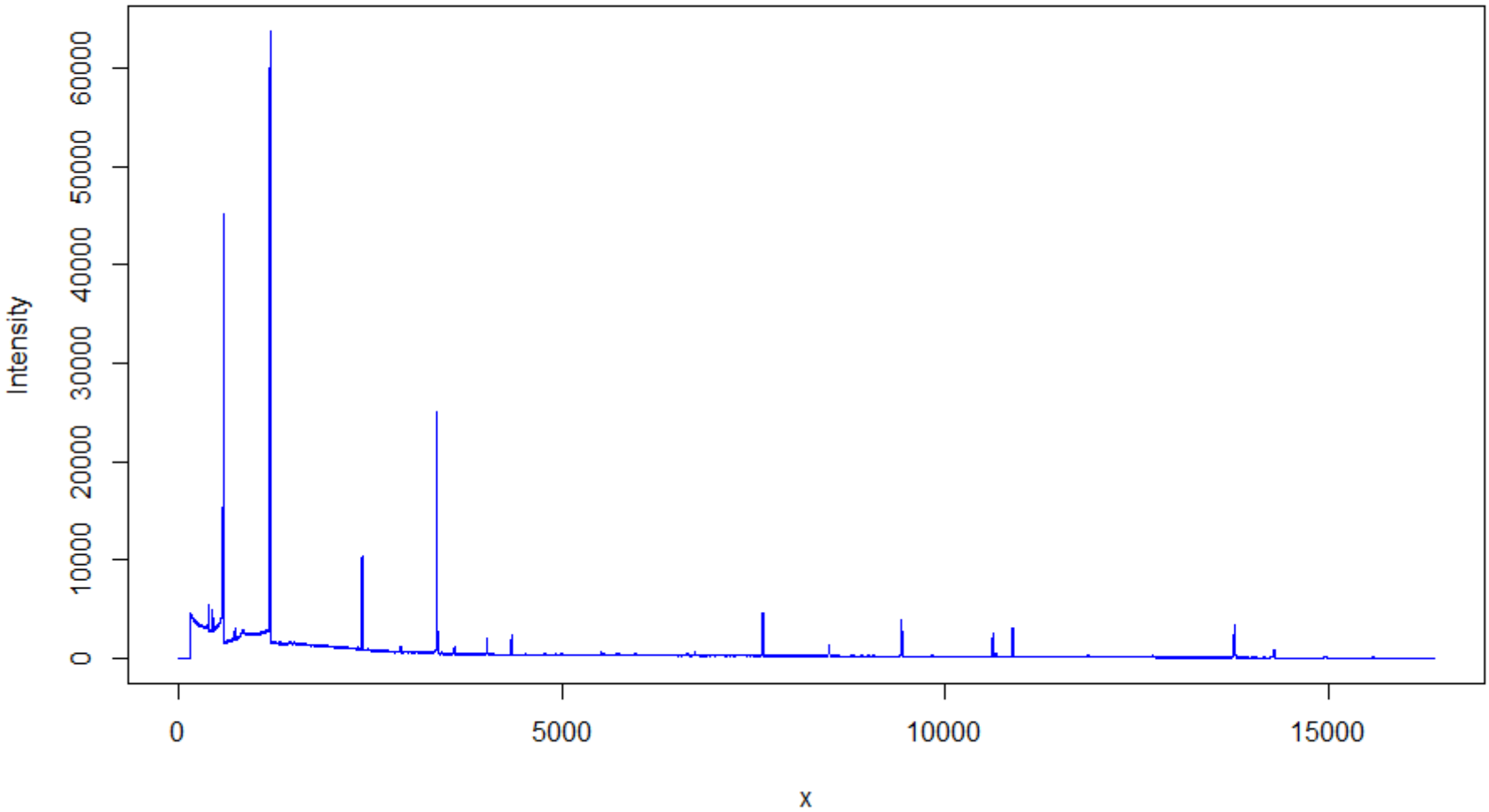
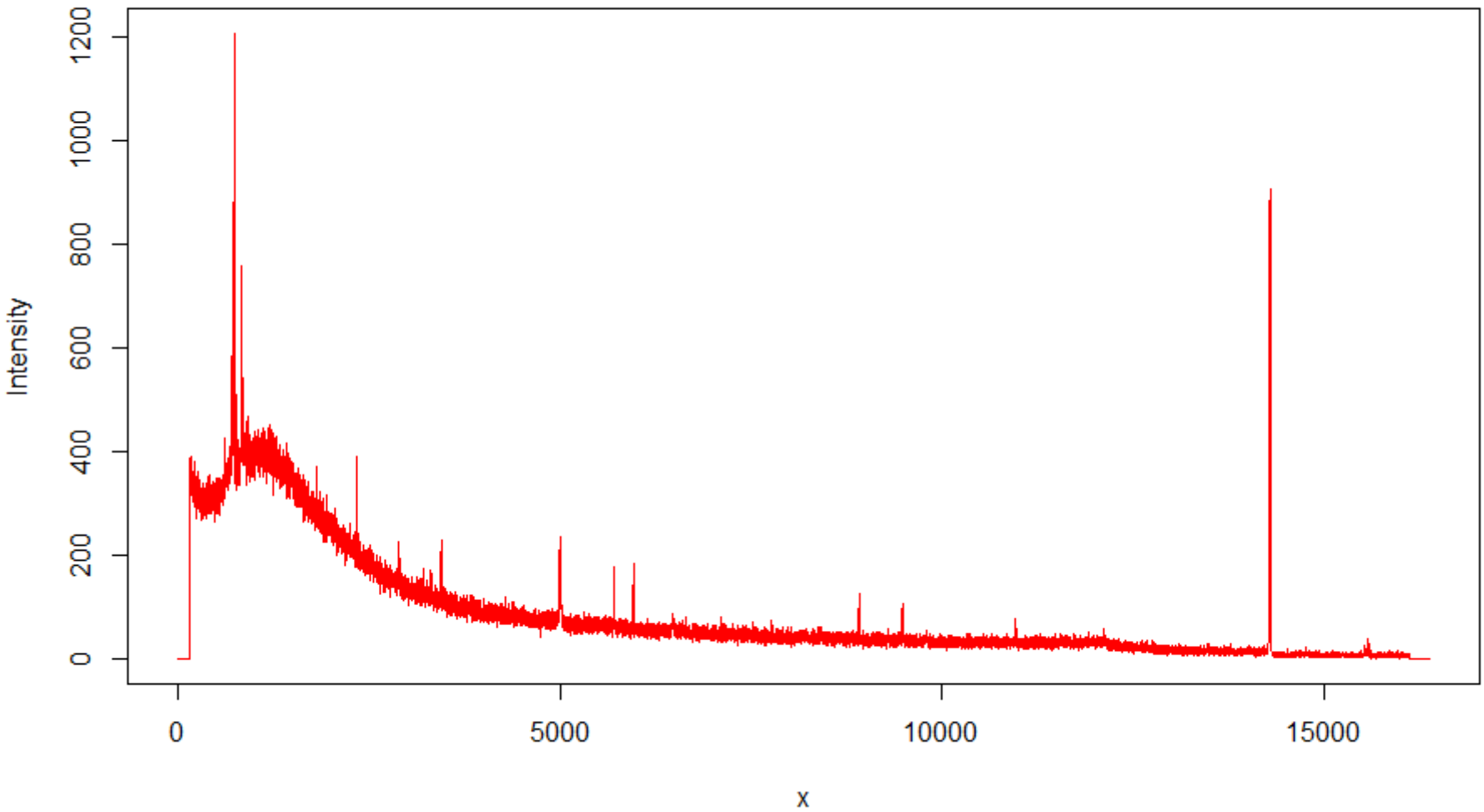
Basic theses

- Nuclear radiation spectra of calibration and test samples were obtained, as well as radiation background data, on a semiconductor spectrometer;
- A programm on ROOT was written to compute the curve of specrometers absolute efficiency and activities of certain radioactive isotopes in the test sample;
- A programm on ROOT was written with equivalent functionality;
- Activities of isotops, computed by theese programs, differ by a quantity comparable with statistical error. The calculation on R is less efficient and has extra complications.
- Using R as a replacement for ROOT in nuclear physics seems impractical. It may be interesting to consider using Python due to its possibilities to interact with other languages.

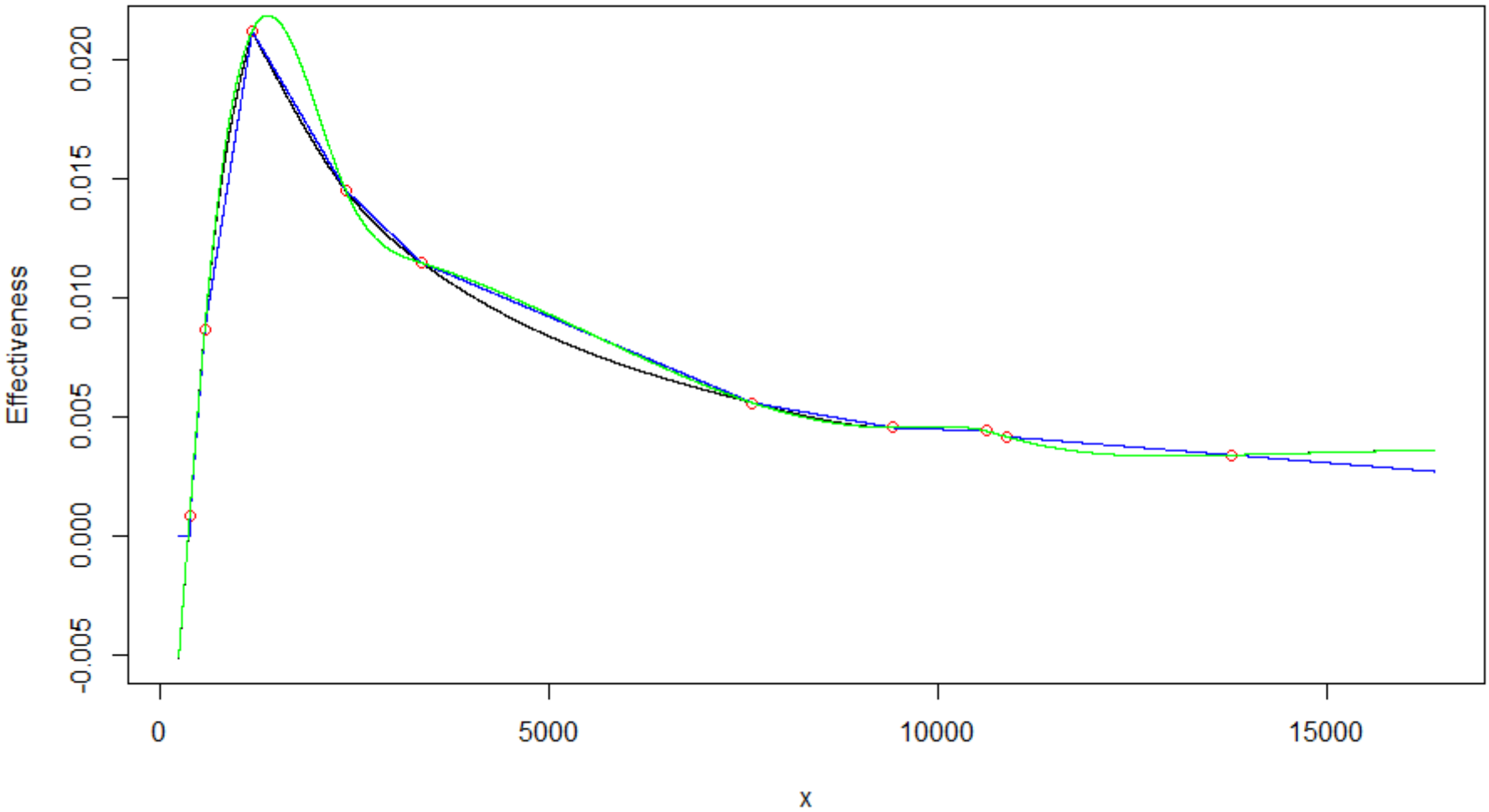
Calibrational data



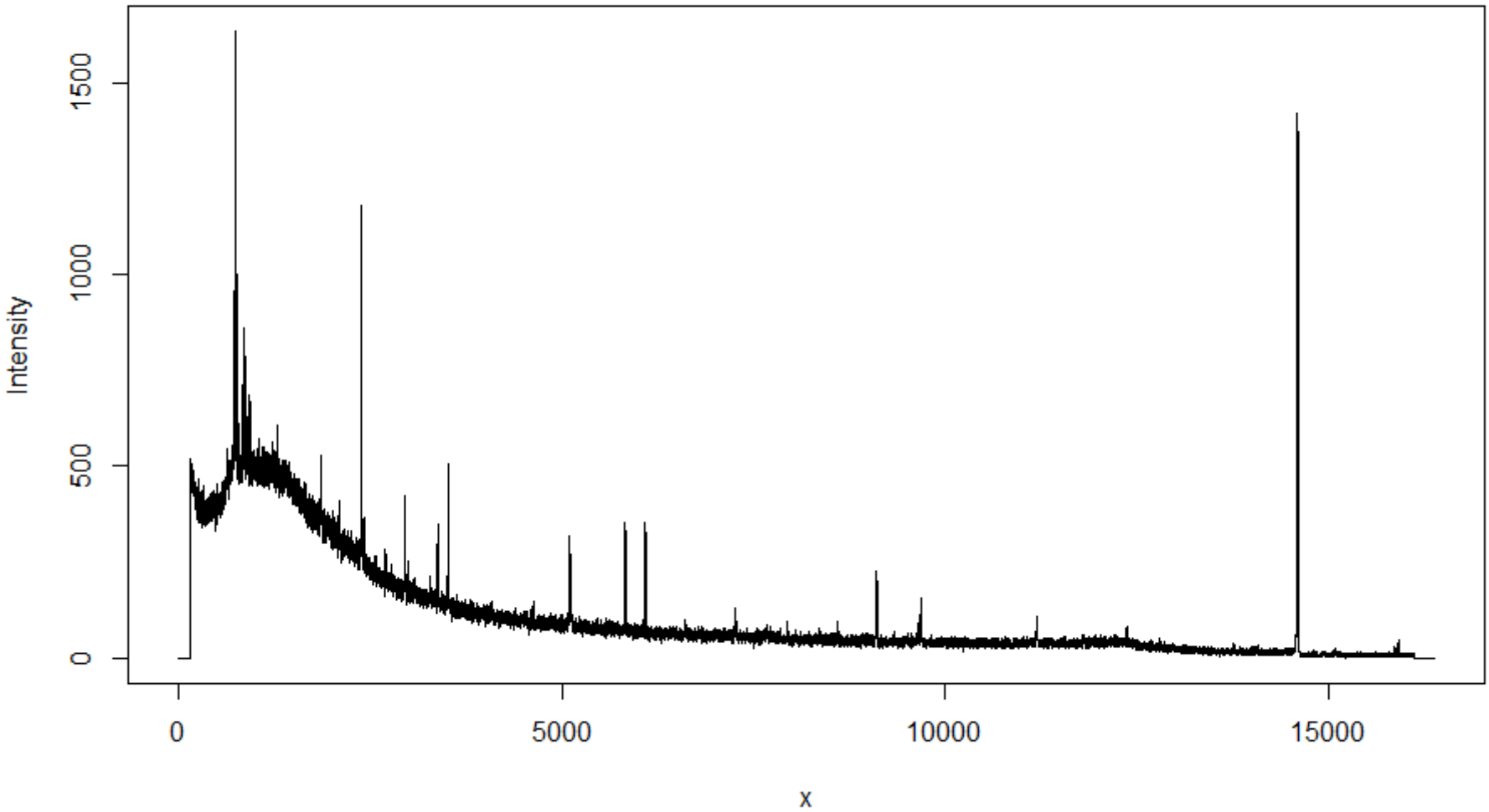
Background radiation



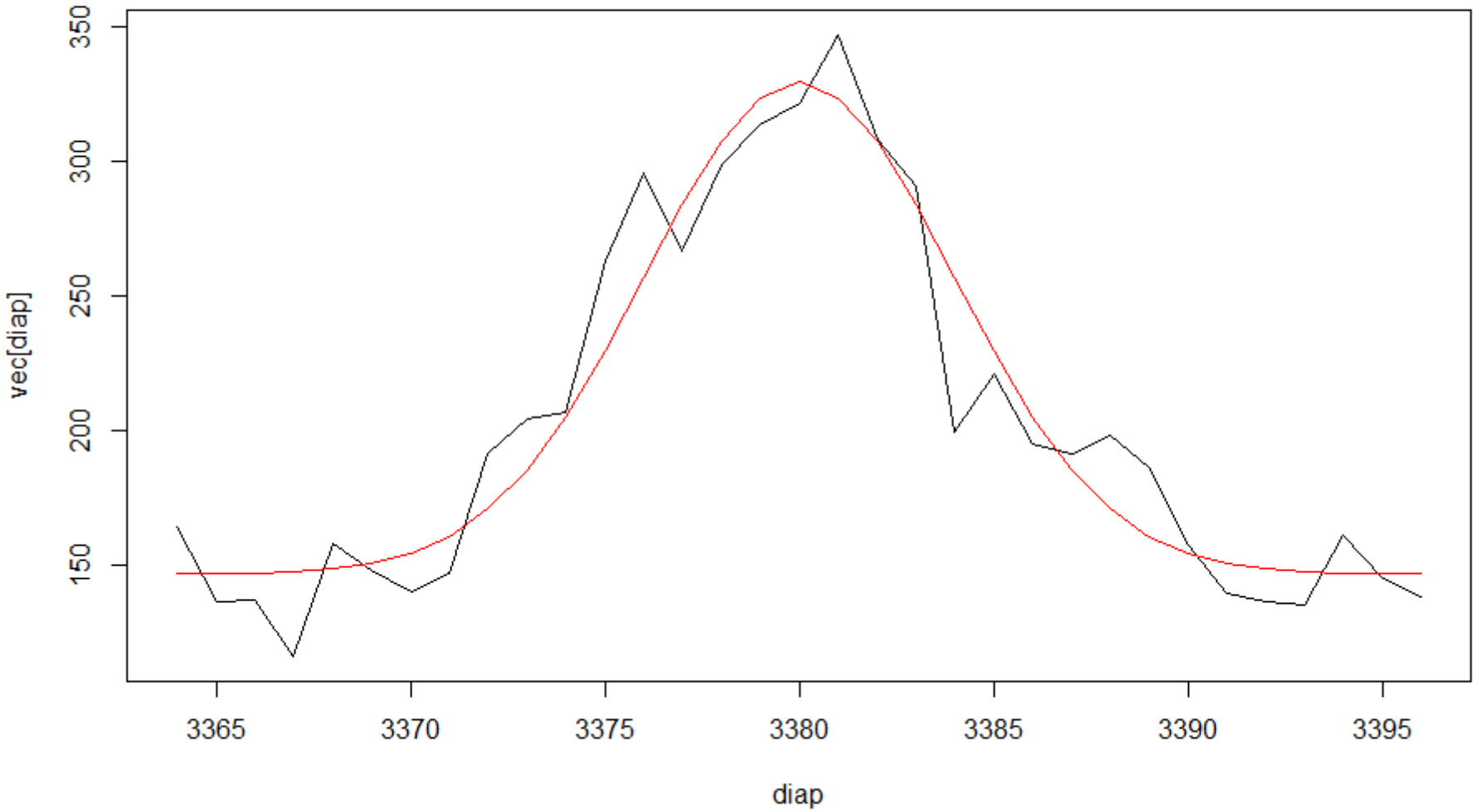
Absolute efficiency curve options



Test geological spectrum



Example 1: an isotope radiation line with low intencity



Example 2: the sae line in background radiation