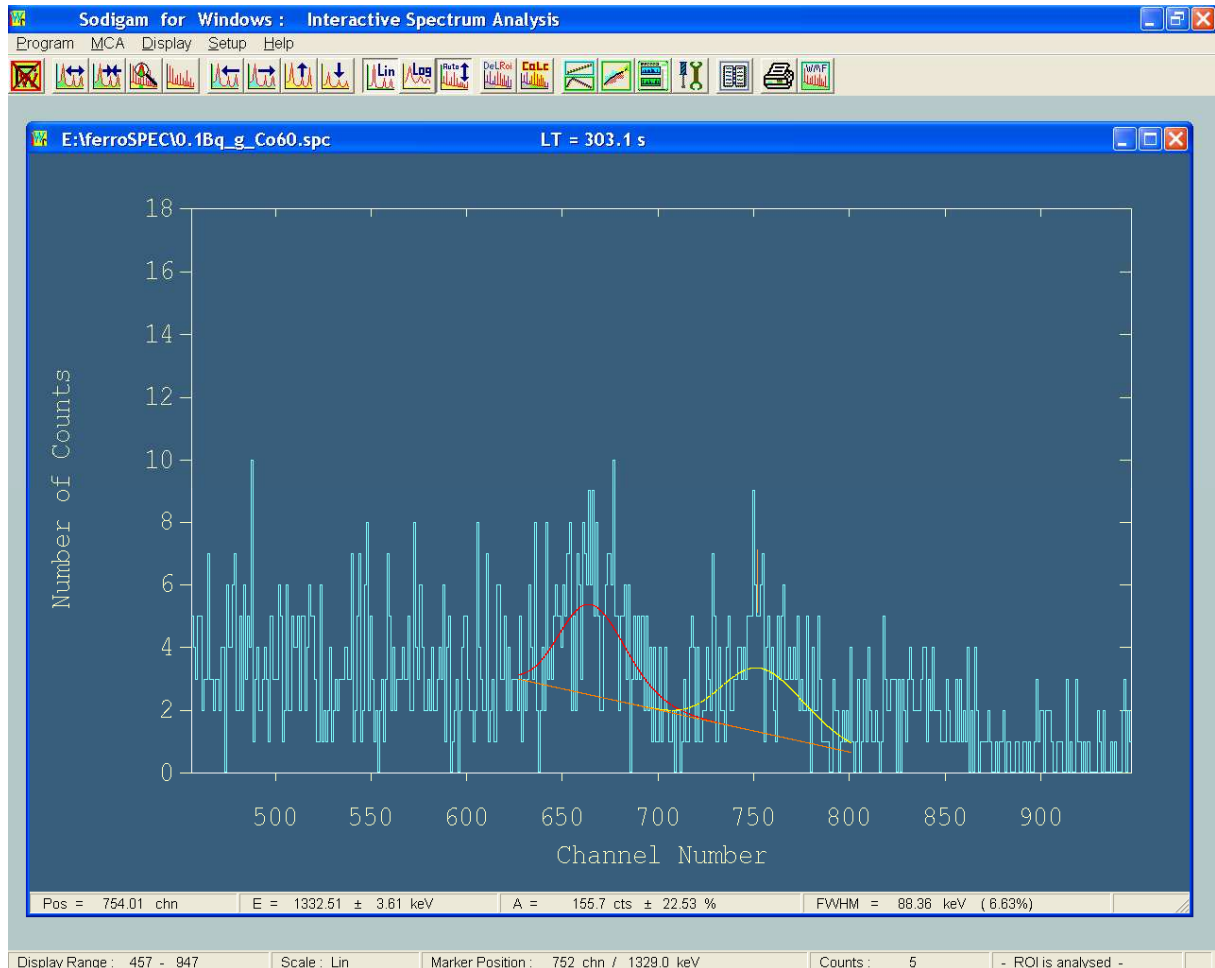


Measurement of ^{60}Co in steel smelting



Spectrum measured for 5 minutes with a 3"x3" NaI(Tl) detector inside a 50 mm thick lead castle from 100 grams sample containing 0.10 Bq/g of ^{60}Co . The spectrum was measured with a detector having 7% resolution (FWHM for the 661.6 keV peak from ^{137}Cs)

The ^{60}Co peaks in the spectrum were fitted with the SODIGAM program for high-precision analysis of scintillator spectra. The fits of the ^{60}Co peaks are indicated as red and yellow lines, the baseline under the peak is plotted brown. The uncertainty of the fitted peak area is $\pm 22.5\%$, and the activity in the sample is fitted as:

$$A = 0.103 \pm 0.023 \text{ Bq/g}$$

The detection limit is calculated from this spectrum as 26 counts, which for the set-up is equivalent to 0.0045 Bq/g in 5 minutes measuring time.

From experience we estimate a "routine-work" detection limit which can be confirmed even by untrained operators as 0.1 Bq/g in 5 minutes measuring time.

A significant reduction of detection limits can be achieved with a room-temperature B380 BrillanCe (LaBr₃(Ce)) scintillation detector with resolution <3%, however, at enhanced cost.