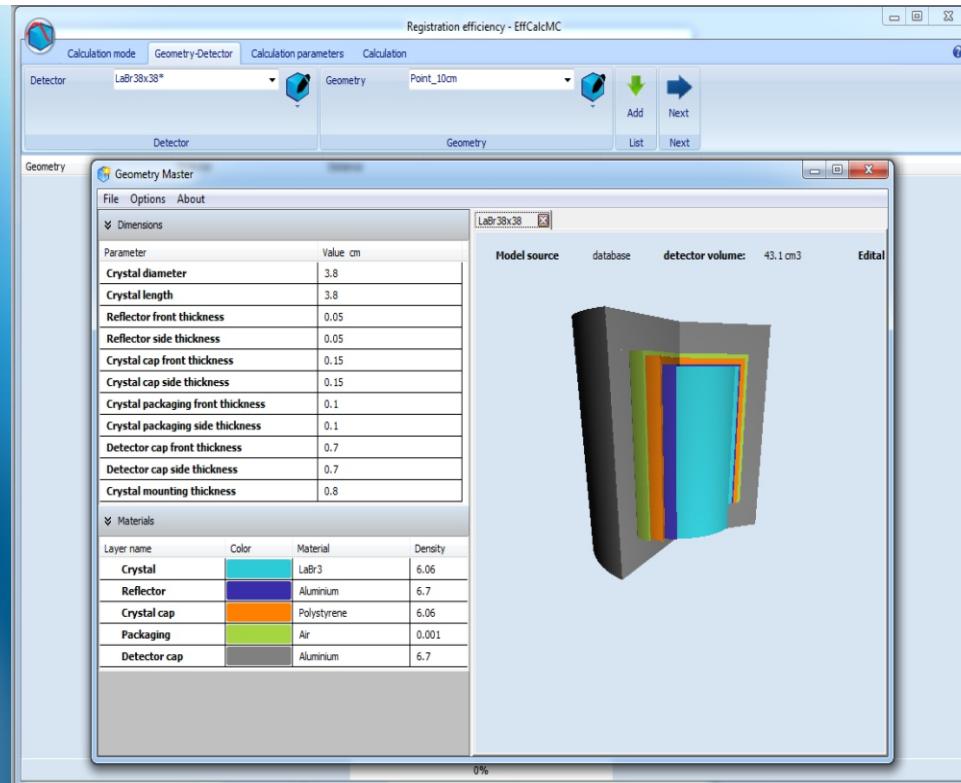


## Specification

- detectors and measurement geometries parameters setting and saving in database;
- lines and radionuclides lists creation;
- calculation of detection efficiency and correction factors for true coincidence using Monte-Carlo method;
- data filtering;
- creation and addition of correction factors for true coincidence library;
- data viewing and saving in detection efficiency library;
- correction of gamma-radiation intensities in radionuclides library;
- batch processing possibility for several geometries and energy ranges.



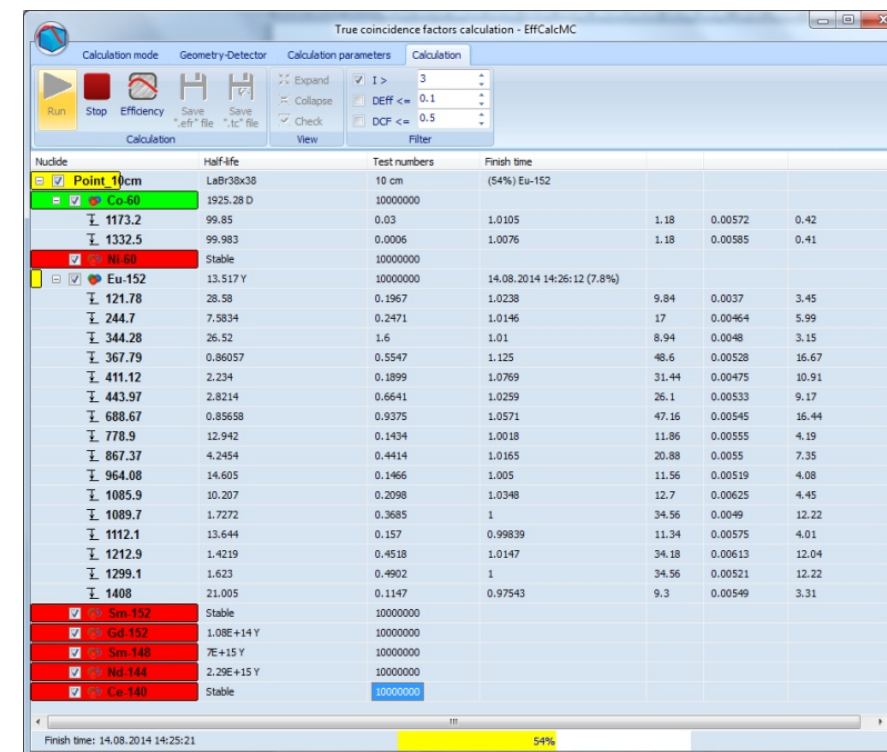
## Nuclide Master Plus software package

### Application

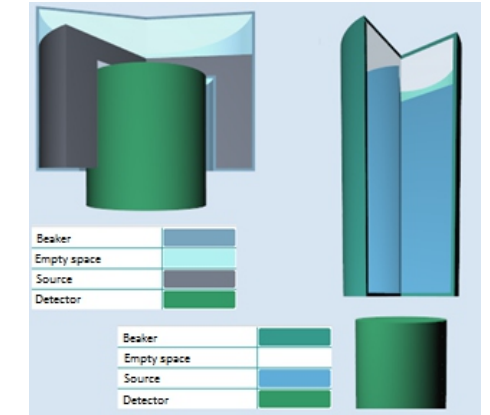
Nuclide Master Plus software package has been developed for calculation of detection efficiency and correction factors for true coincidences. It is also used for correction of gamma radiation intensities in radionuclides library. EffCalcMC (Efficiency Calculation Monte-Carlo) is the main program.

The calculation is based on Monte-Carlo method using parameters of the required nuclides from the library of evaluated nuclear structure data ENSDF. The factors can be calculated for different detectors types (semiconducting and scintillation) which are saved in database compatible with EffMaker software. Marinelli vessels, cylinder and point can be used as the measurement geometries.

TCCFCALC (True Coincidence Correction Factor CALCulation) utility is created to solve true-coincidence summing in/out effect problem in different applications of gamma-spectrometry. It allows to perform calculations for any known gamma-emitting radionuclides and for a wide set of measurement geometries including scintillation and HPGe detectors with point and volumetric sources (Marinelli or cylindrical beaker with arbitrary dimensions).



Nuclide	Half-life	Test numbers	Finish time
Point 10cm	LaBr3x38	10 cm	(54%) Eu-152
Co-60	1925.28 D	10000000	
1173.2	99.85	0.03	1.0105
1332.5	99.983	0.0006	1.0076
Ni-60	Stable	10000000	
Eu-152	13.517 Y	10000000	14.08.2014 14:26:12 (7.8%)
121.78	28.58	0.1967	1.0238
244.7	7.5834	0.2471	1.0146
344.28	26.52	1.6	1.01
367.79	0.86057	0.5547	1.125
411.12	2.234	0.1899	1.0769
443.97	2.8214	0.6641	1.0259
688.67	0.85658	0.9375	1.0571
778.9	12.942	0.1434	1.0018
867.37	4.2454	0.4414	1.0165
964.08	14.605	0.1466	1.005
1085.9	10.207	0.2098	1.0348
1089.7	1.7272	0.3685	1
1112.1	13.644	0.157	0.99839
1212.9	1.4219	0.4518	1.0147
1299.1	1.623	0.4902	1
1408	21.005	0.1147	0.97543
Sm-152	Stable	10000000	
Gd-152	1.08E+14 Y	10000000	
Sm-148	7E+15 Y	10000000	
Nd-144	2.29E+15 Y	10000000	
Ce-140	Stable	10000000	



TCCFCALC (True Coincidence Correction Factor CALCulation) utility has been added to Nuclide Master for:

- calculation of true coincidence correction factor and correction of gamma radiation intensities in radionuclides library;
- calculation of detection efficiency.