Intercomparison sample preparation and characterization

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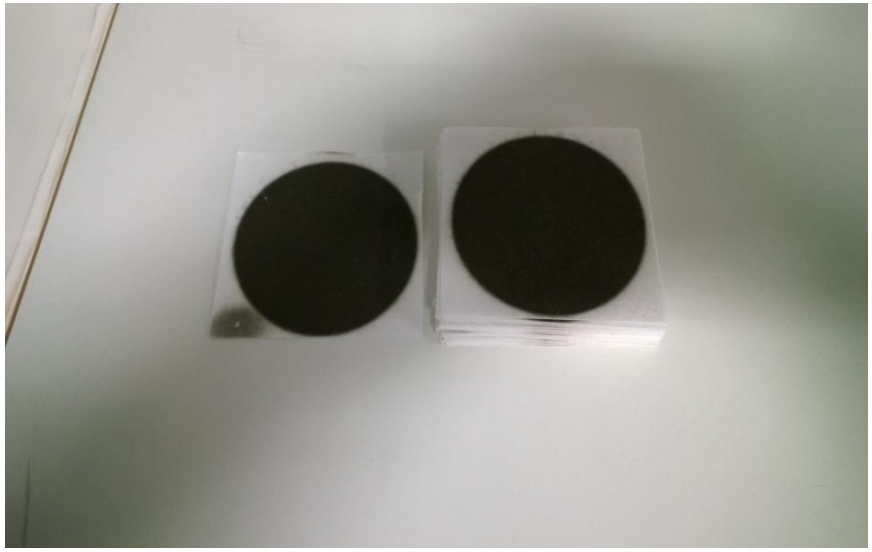
Sample material

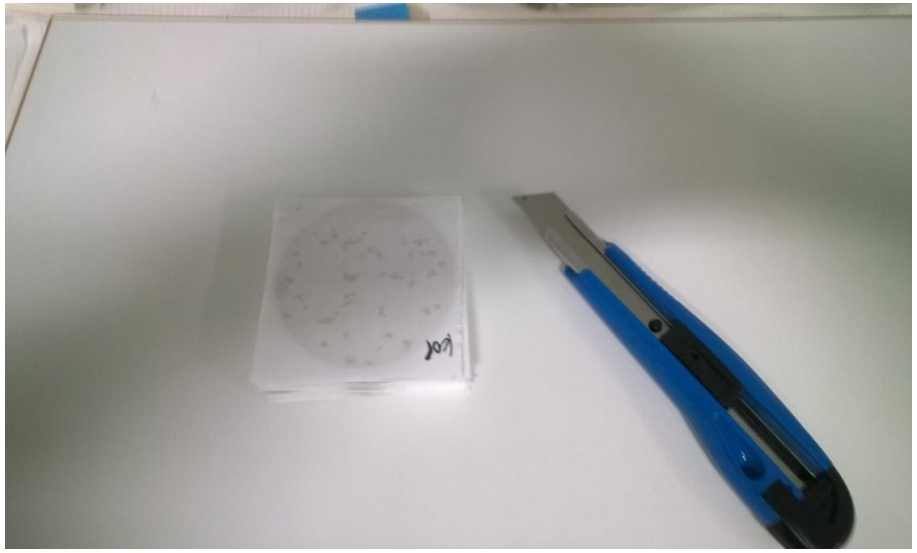
- Aim of the intercomparison exercise involving a physical sample was to look how labs would perform in
  - Coincidence corrections
  - Low-energy efficiency calibrations
  - … and of course to check for outliers
- Suitable sample material, that was readily available, was post-Fukushima air filters from March-April 2011
- Air filter samples, taken with high volume air sampler in Kotka, contained Cs-137, Cs-134 and Pb-210 with high enough activities to make samples that could be counted in reasonable time scales
- Mechanical properties of the filter material are also suitable for this type project

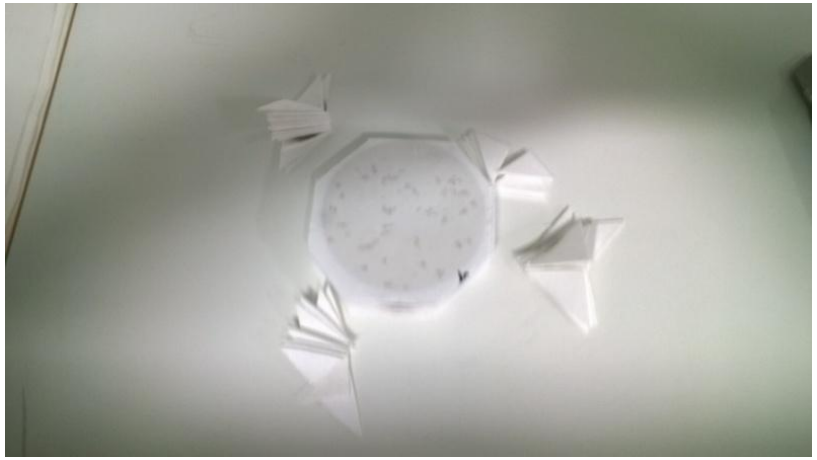
Sample preparation procedure

- Camfil glass fibre CS 5.0 matrix containing radioactive particles originating from Fukushima
- Exposed filter material was pressed, grinded and divided into individual samples with equal masses
- Activities of individual samples were measured to ensure homogenity

Sample preparation

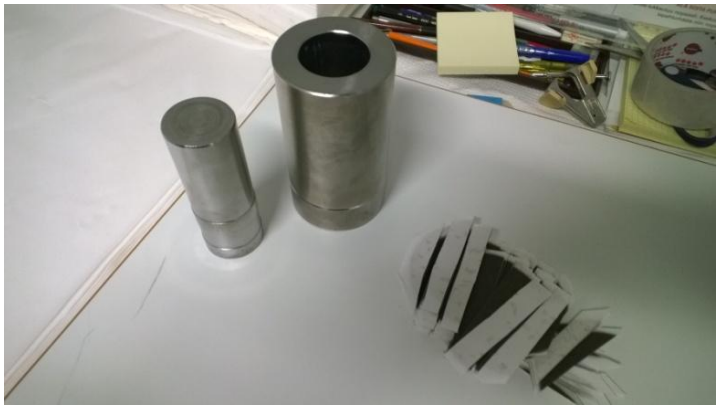






- Camfil glass fibre CS 5.0 filter material
- Filter pieces with 77mm round exposed area
- Non-exposed area was removed by cutting

Sample preparation



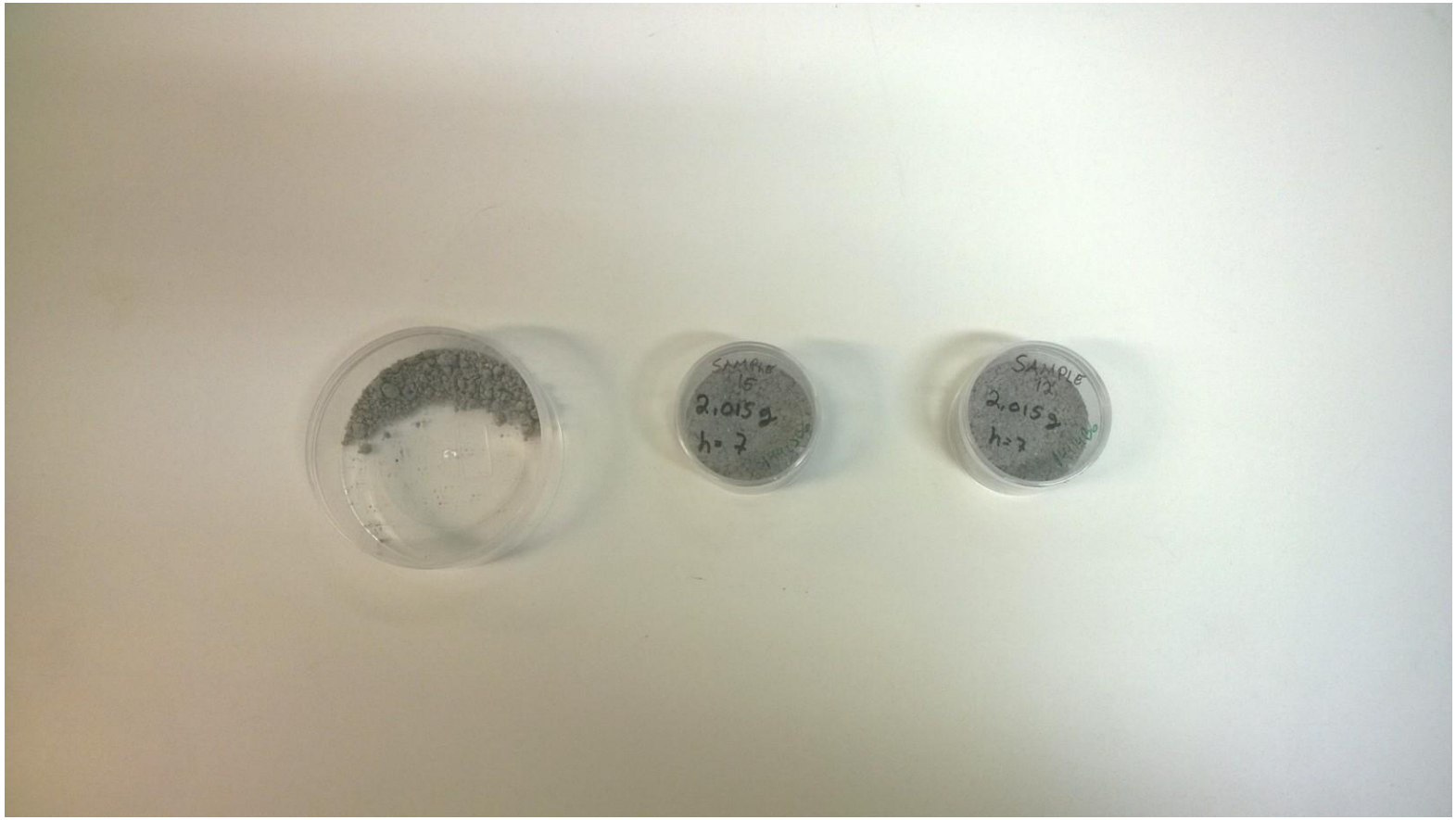
- Exposed filter area was cut into strips and compressed into a disc

Sample preparation

- Compressed filter discs were grinded in a blender

A rather dry filter Martini in the making…

Sample preparation



Powdered material was divided into individual samples. Sample beakers were send to participants.

Sample characterization

- All samples were analyze gammaspectrometrically to determine activity concentrations and to check for sample homogeinity
- Same detector and same sample geometry was used for all measurements, providing fairly accurate comparison
- Activity differences between individual samples were less than 4% (around the mean value) for Cs-134, Cs-137 and Pb-210
- Reflects mainly the particulate nature of the sampled medium (dust particles in outside air)

Sample dispatch and reporting

- Samples were delivered to participants during the summer
- Alltogether 8 samples were sent out
- Reporting deadline was in early September, although this was not strictly enforced
- Results in Excel format via email
- Additional details regarding analysis procedures were requested (e.g. detector type, analysis software)