

Title	Urban Gamma Spectrometry: Report 1
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ISBN	978-87-7893-257-0
Date	June 2009
Project	NKS-B / UGS
No. of pages	62
No. of tables	17
No. of illustrations	65 (some of which are composites)
No. of references	13
Abstract	<p>This report contains the present status and results for the NKS UGS-project per 1 June 2006 for NKS partners DTU, Denmark, and STUK, Finland.</p> <p>The Danish and Finnish CGS systems are not of similar types. The Danish CGS system(s) only make use of one NaI(Tl) detector whereas the Finnish CGS system consists of several detectors, NaI(Tl) and HPGe both and as an additional feature the Finnish detectors have position dependent different fields of view.</p> <p>Furthermore, the Finnish system is equipped with an air sampling system. In terms of operation, the Danish detector is located r on the rooftop whereas the Finnish detectors are located inside the vehicle.</p> <p>The Finnish and the Danish team use different methods for data processing. STUK uses a hypothesis test method to get robust real time alarms (within 10 seconds) when significant peaks from a previously defined set of nuclides are detected. An alarm for a significantly elevated total pulse rate is sent if none of the predefined nuclides is identified. All data are stored to the LINSSI database, which facilitates easy data retrieval for post processing.</p> <p>DEMA/DTU bases their calculations on full spectrum fitting using NASVD and the Danish software NucSpec. Source signals are found from spectrum fitting residuals or from stripping of energy windows – either by the standard 4-windows method or by a measurement based method where stripping factors for any window of interest can be derived from the measurements themselves.</p> <p>A thorough description of the two systems and data processing methods (including mathematics) are described in this report.</p> <p>For the Danish methods of data processing some comparisons have been made, but no final conclusion has been reached yet. Raw urban data has been investigated along with urban data sets to which source signals have been added and searched for.</p> <p>For the Finnish method calibration plots of the minimum detection limits for two different detector types have been made so far, and survey significance plots from drives around Helsinki during the Athletics World Championship in 2005 are presented.</p>
Key words	Urban Carborne Gamma Spectrometry, Spectrum Stripping, Peak hypothesis, LINSSI, FSC, ASSS, NASVD