UNIVERSITY OF AMSTERDAM

FORENSIC RESEARCH PROJECT

RESEARCH PROJECT

Title	: Determination of the within and between variation of inks with LA-ICP-MS
Keywords	: Chromatography; Evidence evaluation; Ink analysis
Forensic Expertise Area	: Questioned Document and Printer Examination & Forensic Trace Element Analysis
Department	: Digital Technology and Biometrics / Microtraces
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SHORT DESCRIPTION

There are several optical and chemical techniques available to compare inks. Within the NFI the Laser Ablation Inductively Coupled Plasma Mass Spectrometer (LA-ICP-MS) is frequently used for this purpose. This technique is fast, does not require any sample preparation, and the discriminative power is high.

Ideally, the outcome of the LA-ICP-MS analysis needs to be evaluated against the 'background' variation of Known Comparisons of reference material: both Known Matches (KM, within variation) and Known Non Matches (KNM, between variation). This reference material needs to be representative for the relevant population of inks.

Currently we do not have a good representation of this 'background' variation. The goal of this research project is to determine this 'background' variation that can be used in the evaluation of casework analyses to obtain the Likelihood Ratio. Inks which are involved are ballpoint pen inks and inkjet printer inks.

REFERENCES

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2. Naes, Benjamin E., "Elemental Analysis of Glass and Ink by Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICPMS) " (2009), FIU Electronic Theses and Dissertations, Paper 207. http://digitalcommons.fiu.edu/etd/207

3. C. Weyermann et al., Statistical discrimination of black gel pen inks analysed by laser desorption/ionization mass spectrometry, Forensic Science International, 217 (2012), 128, 127–133

4. P. Vergeer, et al., "Likelihood ratio methods for forensic comparison of evaporated gasoline residues", Science & Justice, Available online 22 May 2014, ISSN 1355-0306, http://dx.doi.org/10.1016/j.scijus.2014.04.008

REQUIRED/RECOMMENDED EXPERTISE
Statistics, Chemistry