



ICAM

International Council for
Applied Mineralogy



ICAM 2011 Pre-Congress Workshop

Particle Tracking - Maximising the Use of Liberation Information in Minerals Processing

When	9.00-16.00, 30-31 July 2011 (before ICAM)
Venue	www.radissonblu.com/hotel-trondheim
Who	Pertti Lamberg (Luleå University of Technology) and Sergio Vianna (Julius Kruttschnitt Mineral Research Centre, Queensland)
Max Participants	20
Fee	2500 NOK
Registration	Through ICAM2011 Congress website (see www.icam2011.org)

Workshop description: The course is a two-day hands-on workshop of Particle Tracking. The Particle Tracking is a mass balancing technique of liberation data. When fully utilised, as in the course, the Particle Tracking includes steps which link the particle data into chemical and mineral mass balance of a minerals processing circuit. Finally the balanced particle data will be used in a process simulator. The course will give for the participants deep understanding of the Particle Tracking technique and also basic skills to run the Particle Tracking in the HSC Chemistry software.

The participants will receive a temporary license of HSC Chemistry 7.1 software which will be used during the course. The participants will need to bring their own laptops and must have administrative rights to install the software in their computers. A couple of case studies will be used during the course to illustrate the Particle Tracking technique and familiarise the audience with the HSC software. The following topics will be covered during the workshop

1. Background and description of the Particle Tracking technique
2. Organising your experimental data in HSC Chemistry software
 - o Flowsheet,
 - o Sample points,
 - o Chemical assays,
 - o Liberation data, etc.
3. Element to mineral conversions
4. Unsized and size-by-size mineral mass balancing of plant data
5. Mass balance of liberation data
 - o Importing liberation data
 - o Different steps and options of the Particle Tracking methodology
6. Using mass balanced liberation data in process simulation
7. Strengths, limitations and potential applications of the technique.



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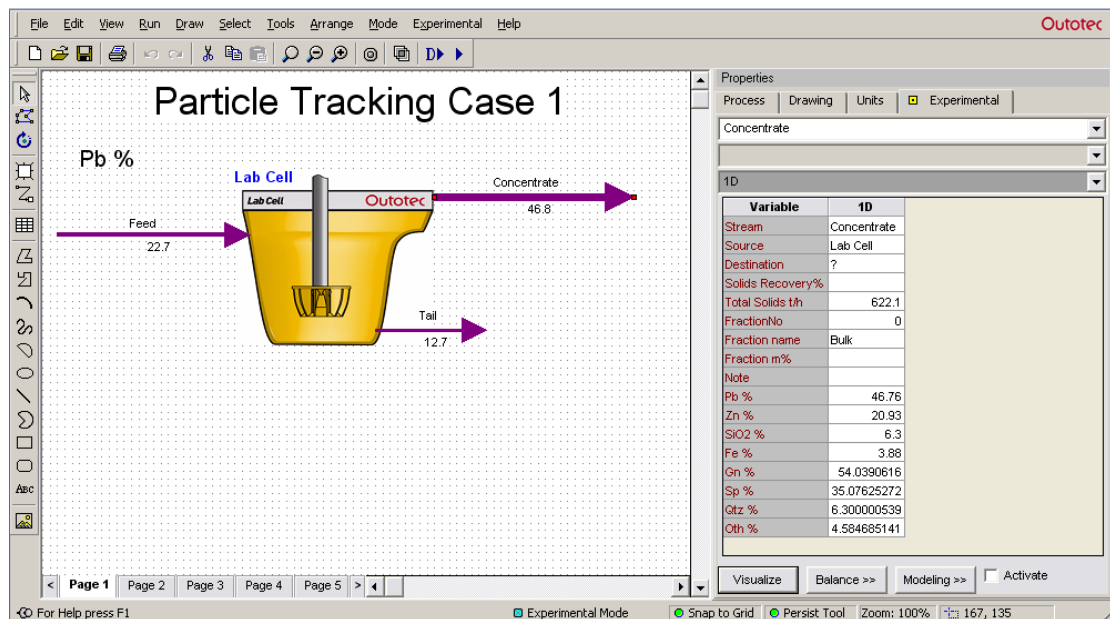
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The HSC Chemistry is more than 10 years-old software specialized in thermochemistry (see www.hsc-chemistry.com). Since 2006, it has included a process simulator HSC Sim which has the capability to import liberation data. The Particle Tracking technique was developed during the AMIRA P9N project in 2007 and in 2011 it will be available for non-P9-sponsors. The lecturers, professor Pertti Lamberg (Luleå University of Technology, Sweden) and doctor Sergio Vianna (University of Queensland, Julius Kruttschnitt Mineral Research Centre, Australia) are the original developers of the Particle Tracking technique and have already run a number of workshops in the subject within the P9 Project. Lamberg is one of the developers of the HSC Chemistry software and has given more than 10 HSC courses since 2005; for example, at the SME Plant Design Conference in 2009 in Tucson, USA.

Audience type: This workshop has been tailored for process mineralogists, metallurgists and researchers who would like to maximise the use of liberation data in the Minerals Industry.

Prospective number of participants As this is a hands-on workshop we can take a maximum of 20 people.





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PTrack - Particle Tracking & Multiphase Particle Balancing by P. Lamberg & S. Vianna, 2007-2011

File Edit Tools Help

Balancing Master Data Mineral Setup **Progress** Results Error

Recovery %

wt% mineral in a binary particle	Recovery %
0	18
10	22
20	25
30	28
40	32
50	35
60	38
70	40
80	42
90	45
100	48

wt% mineral in a binary particle

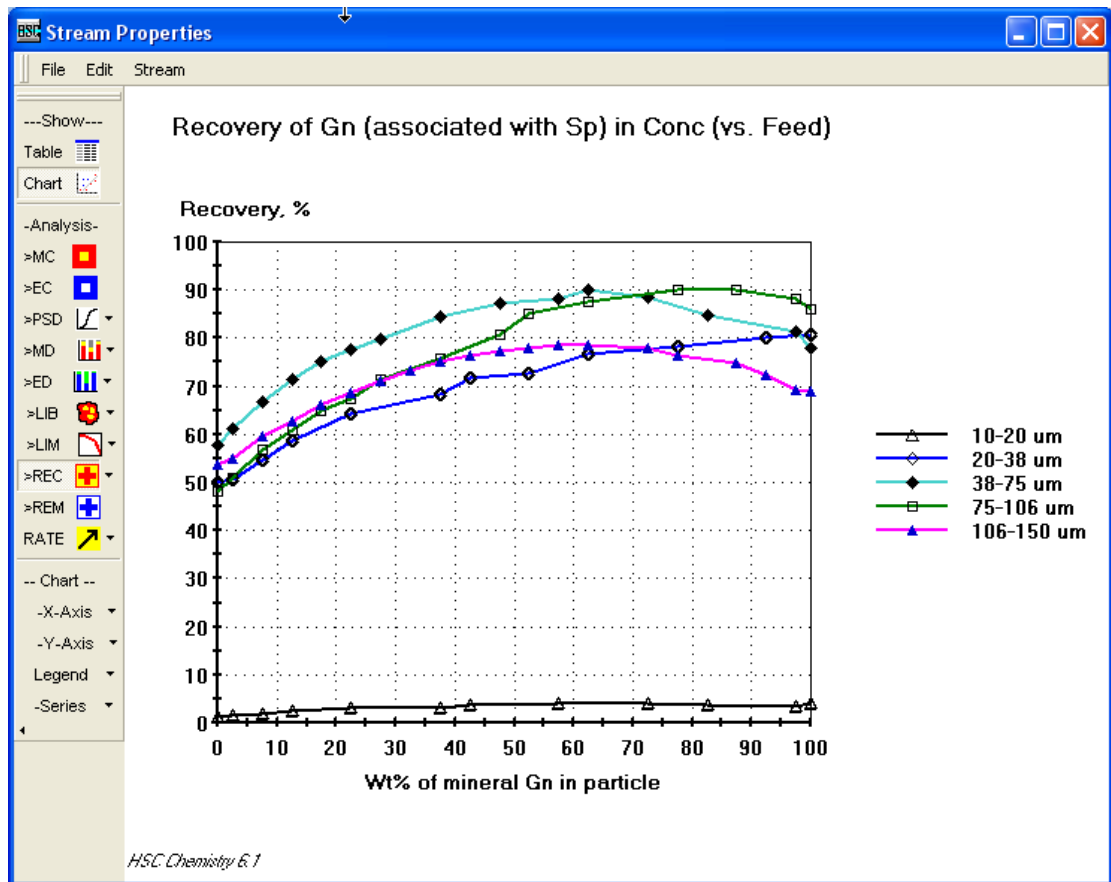
Particles / Bin

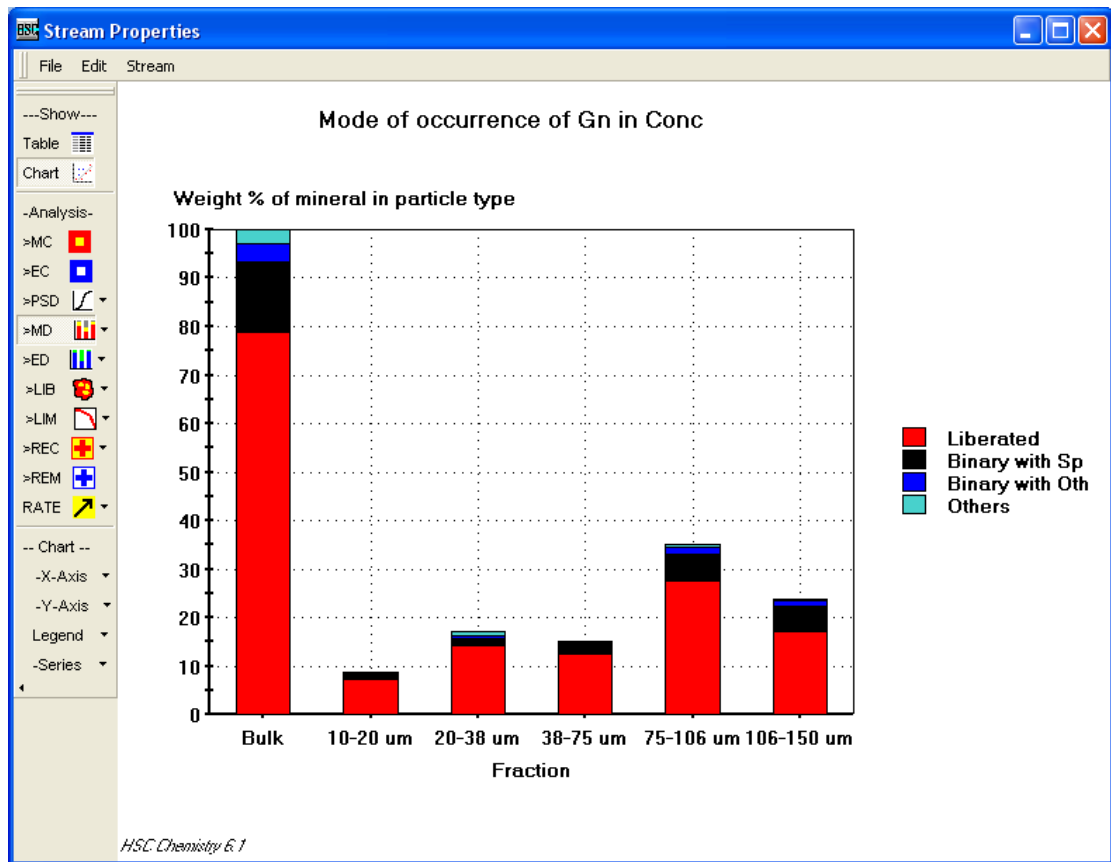
Phase	Particles / Bin
0	35693
1	12340
2	760
3	209
4	209
5	209
6	209

Phase

Step 4. Creating bin ref using Tail
Step 4. Creating bin ref using Concentrate
Step 4. Creating bin ref using Feed
Stage 0. Reading MLA data of stream /
Stage 0. Reading MLA data of stream Tail / +150 um
Stage 0. Reading MLA data of stream Tail / 106-150 um
Stage 0. Reading MLA data of stream Tail / 75-106 um
Stage 0. Reading MLA data of stream Tail / 38-75 um

Test Run Close

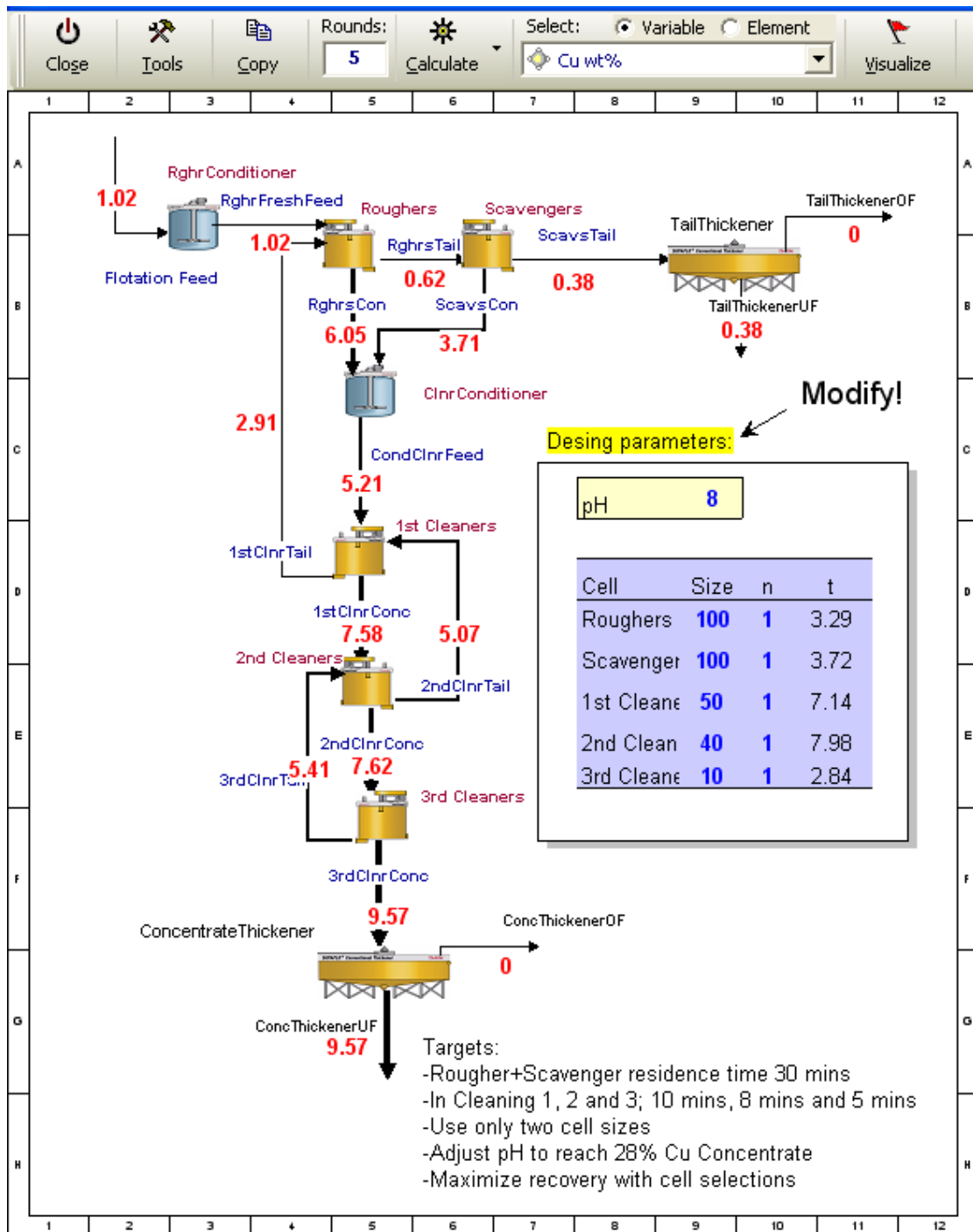






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Workshop Leaders:

Pertti Lamberg



Pertti Lamberg graduated in 1990 with a master degree in geology from University of Oulu (Finland) and received his doctoral degree from the geology department at University of Turku in 2005. Pertti worked for 17 years as a senior researcher in mineral processing at Outotec's research center, Pori Finland. His post doc year he spent as a senior research fellow at the Julius Kruttschnitt Mineral Research Center at University of Queensland. In 2011 Pertti started as a professor in geometallurgy in Luleå University of Technology 2011.

Pertti has worked in a wide range from mineral exploration and process mineralogy to minerals processing. In recent years his focus has been in modeling and simulation of minerals processing with special reference to the use of mineral liberation data. Pertti has been one of the developers of HSC Chemistry from 2004.

Sergio Vianna



Sergio Vianna is a minerals processing engineer with over 15 years experience in mineral flotation. He holds a Masters in Engineering Science (MEngSc) in minerals processing from the University Federal of Minas Gerais (Brazil) and a Doctor of Philosophy (Ph.D.) in mining, minerals and materials engineering processing from the University of Queensland (Australia).

Sergio joined the Julius Kruttschnitt Mineral Research Centre (JKMRC) flotation group in 1997 and in 2007, Dr. Vianna was appointed as a Principal Research Fellow by the University of Queensland.

Sergio's expertise is in mineral flotation and process mineralogy. His areas of experience include flotation surveys, gas dispersion measurements, commissioning of flotation cells, liberation analysis and mass balancing, mineralogical characterisation of base metals, gold and iron ores. His current areas of interest are in flotation modelling and simulation, geometallurgy, surface sensitive analytical techniques (XPS, ToF-SIMS, Synchrotron etc) and adsorption of collectors onto mineral surfaces.