

Measurement of Number Concentrations and Sizes of Au Nanoparticles Spiked Into Soil by Laser Ablation Single Particle ICPMS

Supplementary material

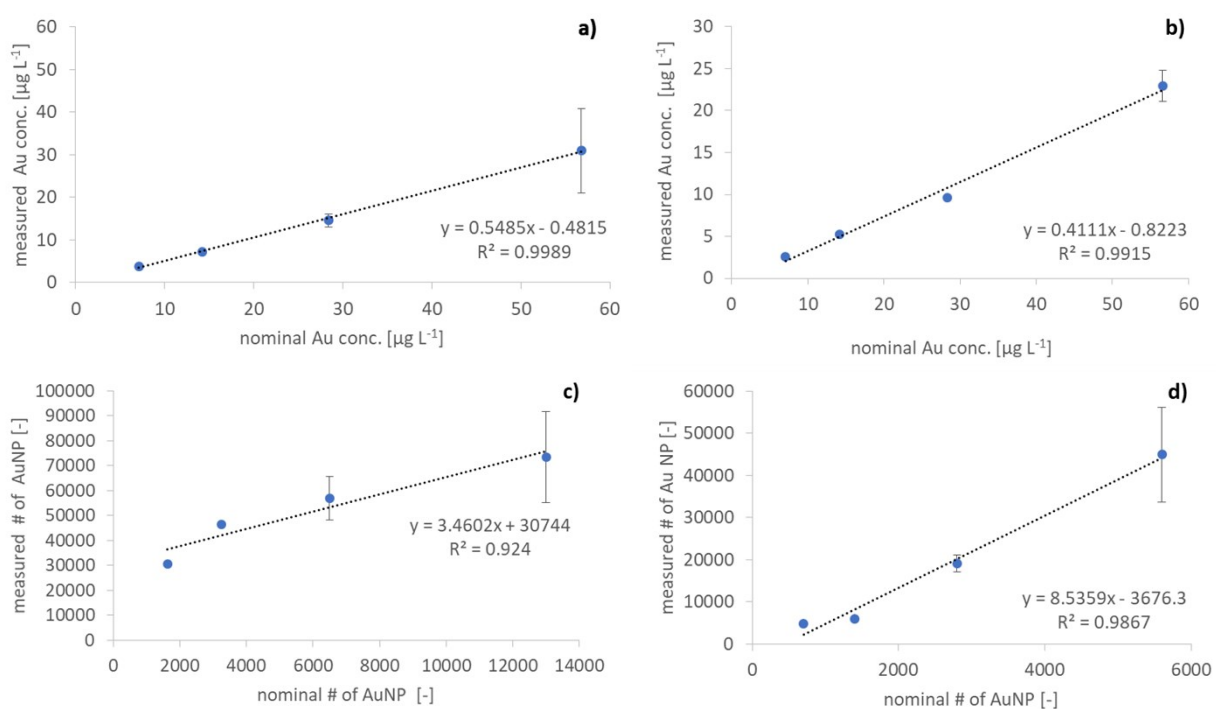


Figure S1: Relationships between nominal and measured concentration as well as nominal number of AuNP and measured number of AuNP for a, c) 60 nm AuNP and b,d) 100 nm AuNPs obtained by LA-sp-ICP-MS (n=3), data was analysed using a fixed threshold to account for the background

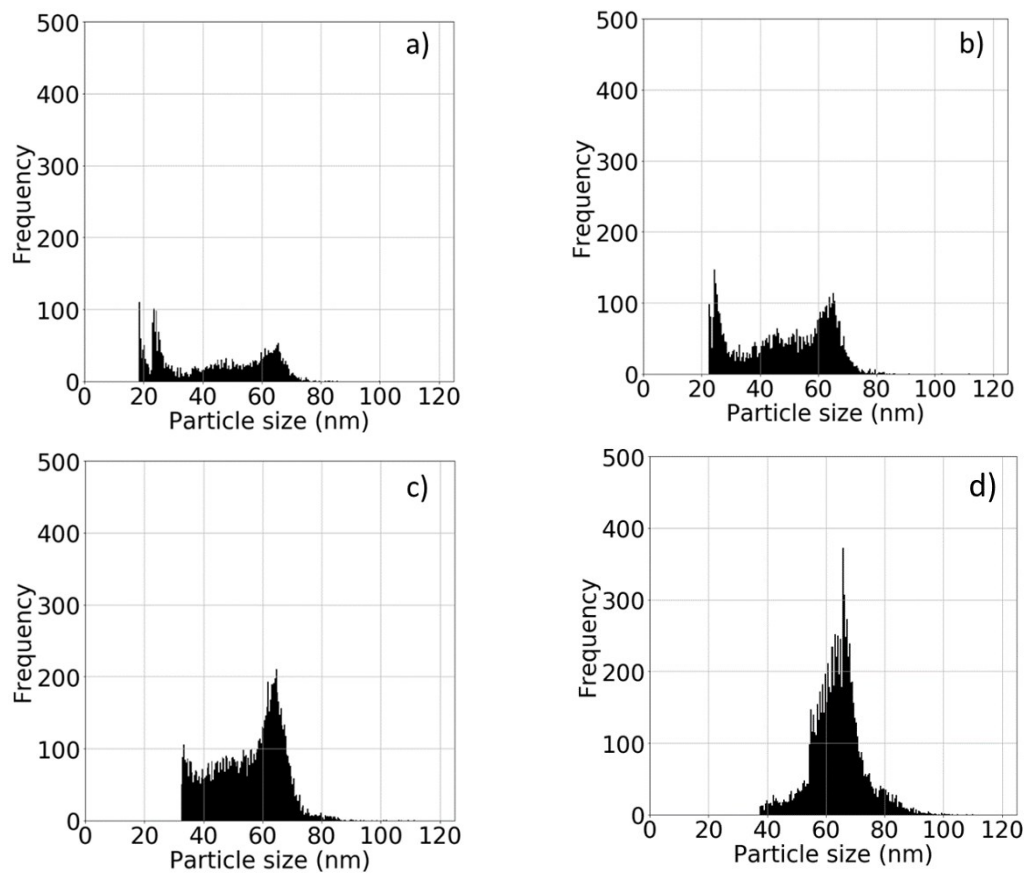


Figure S2: Number based particle size distribution of 60 nm AuNP at concentration a) 7.1, b) 14.2, c) 28.4 and d) 56.8 $\mu\text{g/L}$ obtained by LA-sp-ICP-MS ($n=3$)

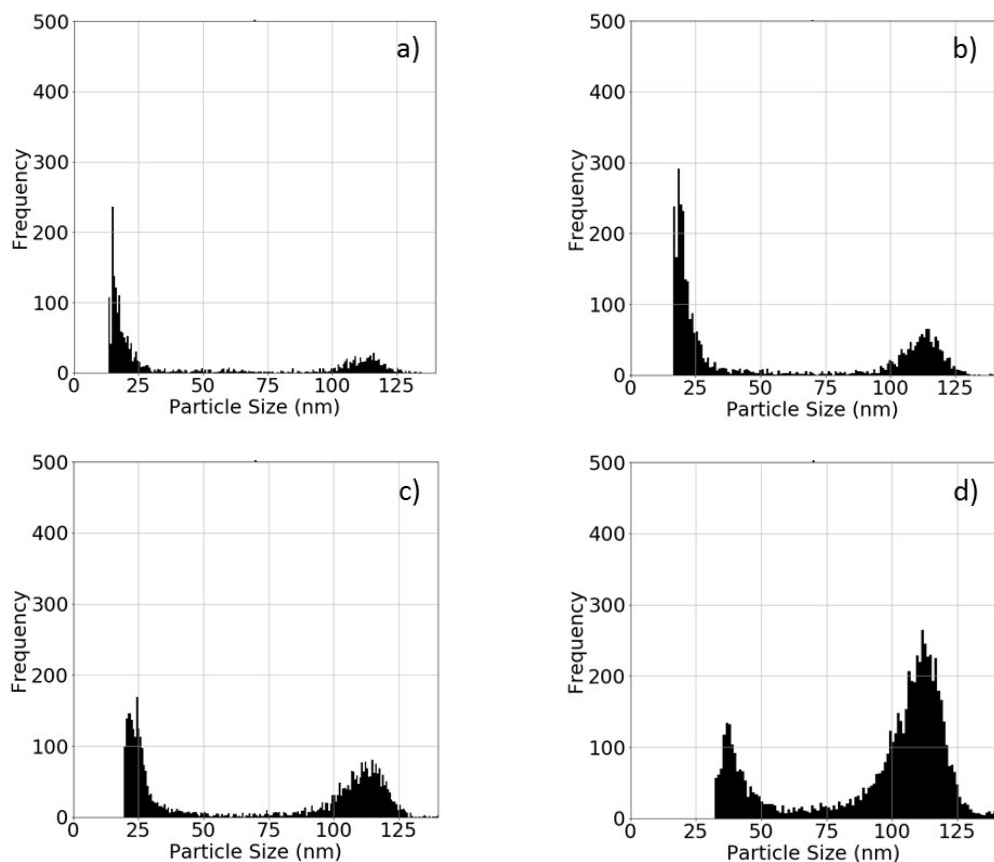


Figure S3: Number based particle size distribution of 100 nm AuNP at concentration a) 7.1, b) 14.2, c) 28.3 and d) 56.6 $\mu\text{g/L}$ obtained by LA-sp-ICP-MS (n=3)

Table S1: AuNP concentration, laser energies and resulting recoveries and mean nanoparticle size (n=3), 0.5 μL spot (60nm), 1 μL (100 nm), c=56.8 mg/L (60nm), c=56.6 mg/L (100 nm), all parameters indicated by (*) were calculated with the 6σ approach

Nominal particle size [nm]	Particle mass conc. [ng/mL]	Particle number conc. [#/mL]	Laser fluence [J/cm ²]	Particle mass recovery REC _{NP(detected)} [%]*	Particle number recovery REC _{NP(detected)} [%]*	particle size, mass weighted mean [nm]*	particle size, number weighted mean [nm]*
60	7.1	1625	0.48	43±17	72±36	52±4.4	47±6.7
	14.2	3250	0.48	40±3.8	60±4.9	53±0.5	49±0.8
	28.4	6500	0.48	42±6.2	49±2.2	57±2.0	56±2.6
	28.4	6500	2.90	30±12	39±8.2	60±1.8	54±4.3
	28.4	6500	3.57	24±3.6	33±2.6	63±3.5	53±7.1
100	56.8	13000	0.48	29±3.8	23±6.5	66±4.8	65±3.9
	7.1	700	0.48	40±2.0	98±1.9	84±3.2	20±0.9
	14.2	1400	0.48	41±2.4	78±1.5	89±3.0	25±0.8
	28.3	2800	0.48	36±1.6	51±6.9	96±0.7	71±22
	56.6	5600	0.48	42±4.4	40±12	104±2.9	106±2.9

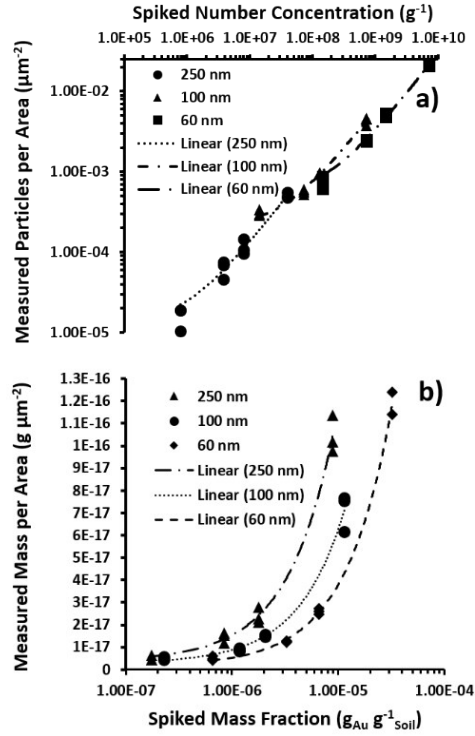


Figure S4 The number a), and mass b) of AuNP per ablated area as a function of the spiked concentration in soils of the 60, 100, and 250 nm AuNP particles.

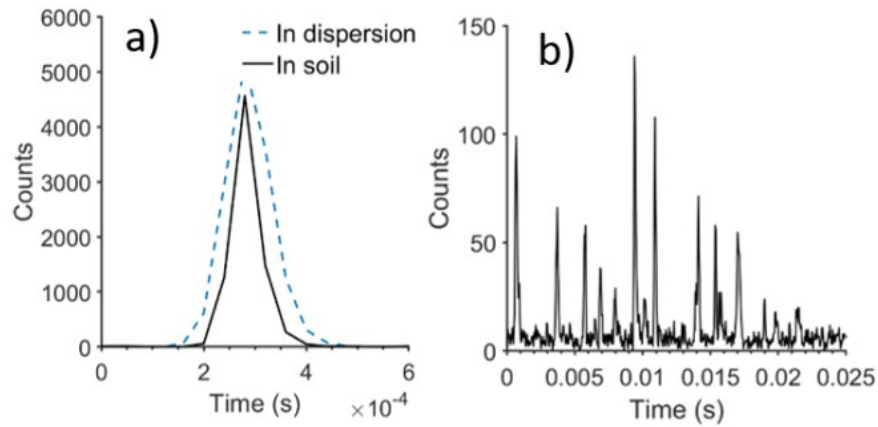


Figure S5: a) Particle events from 60 nm AuNP measured during LA-spICPMS of soil and during aqueous spICP-MS. b) Signal of Indium in soil measured during LA-spICPMS.

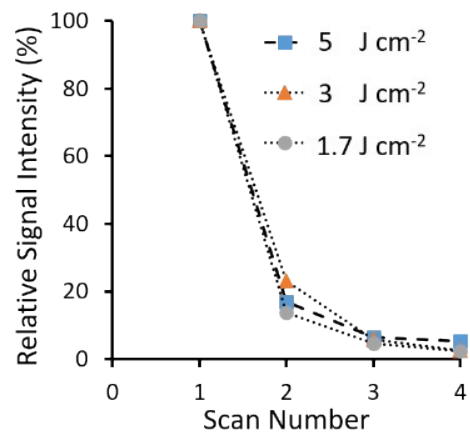


Figure S6: The fraction of the initial In signal measured during the first sweep with the laser as a function of the number of repeated scans over the same area. The experiment is repeated with 1.7, 3, and 5 J/cm² laser energy levels.