

Table 1. Calculation of $s(I_{mean})$ for a non-transient signal using formulae (9) and (14).
 The NIST SRM 612 glass standard was ablated using a linear rastering of the laser beam;
 see Electronic Appendix 4 for the original data and calculus.

Sweep number	U^{238}				
	I_i , cps	I_{2i-1} , cps	I_{2i} , cps	$I_{2i-1}I_{2i}$, cps	$(I_{2i-1}I_{2i})^2$, cps
	original signal	odd sweeps, series a	even sweeps, series b	exact formula (14)	approximate formula (14)
1	2633767	2633767	2510029	123738	15311030775
2	2510029				
3	2784576	2784576	2558131	226445	51277224803
4	2558131				
5	2432935	2432935	2593831	-160896	25887522816
6	2593831				
.....					
231	2662311	2662311	2776435	-114125	13024458563
232	2776435				
$s(I_{mean})$	6334			6806	6807

Table 2. Calculation of $s(I_{mean})$ for a transient signal using formulae (9) and (14). The GJ-1 zircon standard was ablated in the spot regime; see Electronic Appendix 4 for
 the original data and calculus.

Sweep number	U^{238}					Pb^{206}				
	I_i , cps	I_{2i-1} , cps	I_{2i} , cps	$I_{2i-1}I_{2i}$, cps	$(I_{2i-1}I_{2i})^2$, cps	I_i , cps	I_{2i-1} , cps	I_{2i} , cps	$I_{2i-1}I_{2i}$, cps	$(I_{2i-1}I_{2i})^2$, cps
	original signal	odd sweeps, series a	even sweeps, series b	exact formula (14)	approximate formula (14)	original signal	odd sweeps, series a	even sweeps, series b	exact formula (14)	approximate formula (14)
1	802965	802965	787779	15186	230620291	4739	4739	5445	-706	498436
2	787779					5445				
3	763097	763097	757406	5690	32378234	5243	5243	3932	1311	1718721
4	757406					3932				
5	878896	878896	882665	-3769	14202063	2924	2924	4134	-1210	1464100
6	882665					4134				
.....										
611	706158	706158	696662	9496	90175203	4336	4336	3831	505	255025
612	696662					3831				
$s(I_{mean})$	3720			2185	2191	38.4			36.4	36.5

Table 3. Calculation of the uncertainty of mean intensities and their ratios for a replicate series of transient signals using formulae (7,14,16) applied to the individual replicates; these uncertainties are compared to the uncertainty values computed over the whole set of replicates. The NIST SRM 610 glass standard was ablated in the spot regime; see Electronic Appendix 4 for the original data and calculus.

Analysis number	Hg ²⁰¹ &		Pb ²⁰⁴		Pb ²⁰⁶		Pb ²⁰⁷		Pb ²⁰⁸		Th ²³²		U ²³⁵		U ²³⁸		Pb ²⁰⁶ /U ²³⁸			Pb ²⁰⁷ /U ²³⁵						
	<i>I_{mean}</i> , cps	<i>s(I_{mean})</i>	<i>I_{mean}</i> , cps	<i>s(I_{mean})</i>	<i>I_{mean}</i> , cps	<i>s(I_{mean})</i>	<i>I_{mean}</i> , cps	<i>s(I_{mean})</i>	<i>I_{mean}</i> , cps	<i>s(I_{mean})</i>	<i>I_{mean}</i> , cps	<i>s(I_{mean})</i>	<i>I_{mean}</i> , cps	<i>s(I_{mean})</i>	<i>I_{mean}</i> , cps	<i>s(I_{mean})</i>	<i>I^{Pb206}/U²³⁸</i>	<i>s(I^{Pb206}/U²³⁸)</i>	from replicates	with Cov term	without Cov term	<i>I^{Pb207}/U²³⁵</i>	<i>s(I^{Pb207}/U²³⁵)</i>	from replicates	with Cov term	without Cov term
	<i>ind. signal</i>		<i>ind. signal</i>		<i>ind. signal</i>		<i>ind. signal</i>		<i>ind. signal</i>		<i>ind. signal</i>		<i>ind. signal</i>		<i>ind. signal</i>											
1	266	19	34441	312	585999	3517	543356	3347	1277444	9711	2250294	13772	5582	81	2329941	14863	0.2515	0.0024	0.0022	97.3	1.6	1.5				
2	248	20	34106	398	584144	3908	543837	3641	1286636	10313	2249674	14220	5374	87	2307011	14953	0.2532	0.0028	0.0024	101.2	1.9	1.8				
3	279	24	34272	303	583413	3992	540021	3698	1287634	9178	2281934	13947	5496	83	2309488	15143	0.2526	0.0025	0.0024	98.3	1.6	1.6				
4	251	23	34009	341	575752	4226	534272	3060	1268276	9342	2269933	12811	5514	67	2319751	14547	0.2482	0.0024	0.0024	96.9	1.2	1.3				
5	278	22	33678	319	588080	3898	543002	4204	1283199	10608	2273682	14283	5562	87	2306908	13993	0.2549	0.0025	0.0023	97.6	1.7	1.7				
6	233	20	33651	318	580124	4072	537417	3373	1273514	8875	2288806	14163	5647	88	2319387	13470	0.2501	0.0023	0.0023	95.2	1.7	1.6				
7	247	19	33335	304	583659	4367	544789	2910	1296879	8020	2295803	13322	5599	81	2325778	13921	0.2510	0.0027	0.0024	97.3	1.5	1.5				
8	241	21	33903	324	581415	4048	541415	3751	1286113	8864	2299796	15489	5660	81	2313433	13719	0.2513	0.0025	0.0023	95.7	1.5	1.5				
9	230	17	34575	283	596835	4377	547105	3956	1277660	10667	2288492	15631	5474	82	2309234	15002	0.2585	0.0029	0.0025	99.9	1.7	1.7				
10	239	19	33671	338	584171	4928	538105	3743	1267449	9005	2257917	13648	5564	89	2309379	13856	0.2530	0.0031	0.0026	96.7	1.5	1.7				
11	232	16	33903	339	581470	4244	537686	3601	1277235	8510	2287589	13528	5541	72	2313932	14917	0.2513	0.0028	0.0024	97	1.5	1.4				
12	258	20	33788	350	588646	4633	546716	3850	1281708	11529	2302790	14689	5452	85	2333547	15544	0.2523	0.0027	0.0026	100.3	1.8	1.7				
13	218	18	33567	335	575402	4231	530313	4066	1246374	11233	2270065	17539	5535	98	2314539	15332	0.2486	0.0025	0.0025	95.8	1.8	1.8				
14	240	20	34355	386	586180	4322	543948	3872	1275205	10244	2304594	16440	5432	79	2317737	14343	0.2529	0.0026	0.0024	100.1	1.6	1.6				
15	244	21	34328	331	581654	3509	532495	3578	1259835	9793	2276497	15631	5394	82	2299881	16754	0.2529	0.0027	0.0024	98.7	1.7	1.6				
16	229	20	34212	309	583663	4272	539441	2931	1267877	8864	2287178	13537	5569	78	2330911	14223	0.2504	0.0028	0.0024	96.9	1.5	1.5				
17	206	19	34009	289	586326	4246	543531	3508	1272854	9963	2301613	14345	5466	87	2350088	13911	0.2495	0.0026	0.0023	99.4	1.8	1.7				
18	245	20	34011	307	585924	4293	541352	3577	1268185	9994	2297838	16838	5553	86	2354143	14868	0.2489	0.0025	0.0024	97.5	1.6	1.6				
<i>s(I_{mean}) repl.</i>	19	20	336	327	4832	4171	4728	3593	11587	9706	17566	14658	80	83	14760	14631	0.0025	0.0026	0.0024	1.7	1.6	1.6				
<i>s(s(I_{mean}))*</i>		2		30		343		363		955		1318		7		804		0.0002	0.0001		0.2	0.1				

² Hg²⁰¹ demonstrates a weak non-transient background noise not changing during the ablation; all other isotopes yield transient signals in a range of intensities reflecting their respective isotope abundances;

* Uncertainty of the uncertainty values of mean intensities and their ratios estimated from the individual signals.