In situ determination of Re-Os isotopes by LA-MC-ICP-MS using Daly detectors: preliminary results

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Elemental (eg. PGEs) and isotopic *in situ* characterisations of (mantle) sulfides are powerful tools to unveil and date magmatic processes. Unfortunately, due to analytical and sample limitations (mantle sulfides Ø<100μm), investigators commonly have the dilemma of choosing between trace elements or Re-Os isotopes. Last year we presented the first *in situ* LASS-MC-ICP-MS/ICP-MS acquisition of trace elements and Re-Os isotopes from a single ablation, therefore solving this Cornelian choice [1]. The Nu Plasma II has since been fitted with 2 new generation Daly detectors in place of the original electron multipliers. The Daly detector offers a more linear signal, a better faraday to multiplier gain stability, a wider peak flat as well as a larger dynamic range compared to conventional ion counters. Building on this upgrade and our previous success, we present newly acquired data investigating the advantages of such detectors for Re-Os isotopes characterisation of sulfides, and give the overall benefits for a LASS-MC-ICP-MS/ICP-MS applications such as *in situ* trace elements and Re-Os in sulfides.

The analytical setting is comprises a Photon-Machines 193nm excimer laser coupled to a Nu-Plasma II MC-ICP-MS fitted with 2 Daly detectors. Re-Os measurements were obtained by collecting masses 185 to 194 using a mixed array of faraday buckets (188 to 194), 2 Daly detectors (185 and 187) and 1 ion counter (186). When in LASS mode an Agilent 7700x ICP-MS is added to the set up. After ablation in a He atmosphere, the analyte is split using a Y connector and carried to the spectrometers via 1/8" tubing.

	Faraday buckets							Daly detector	Electron multiplier	Daly detector
Collector	**H1**	**AX**	**L1**	**L2**	**L3**	**L4**	**L5**	**D0**	**IC1**	**D2**
Mass	194	193	192	191	190	189	188	187	186	185
Pt	*32.98*		*0.78*		*0.01*			*(Isotopic abundances)*		
Ir		*62.73*		*37.27*						
Os			*40.78*		*26.26*	*16.15*	*13.24*	*1.96*	*0.02*	
Re								*62.6*		*37.4*

Table 1: Collector configuration and isotopic abundances.

[1] Gréau, Alard & O'Reilly (2019), *Goldschmidt Conference Abstract*

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