

# Supplement for: Suitability of high-volume aerosol samplers for ultra-trace aerosol iron measurements in pristine air masses: blanks, recoveries and bugs

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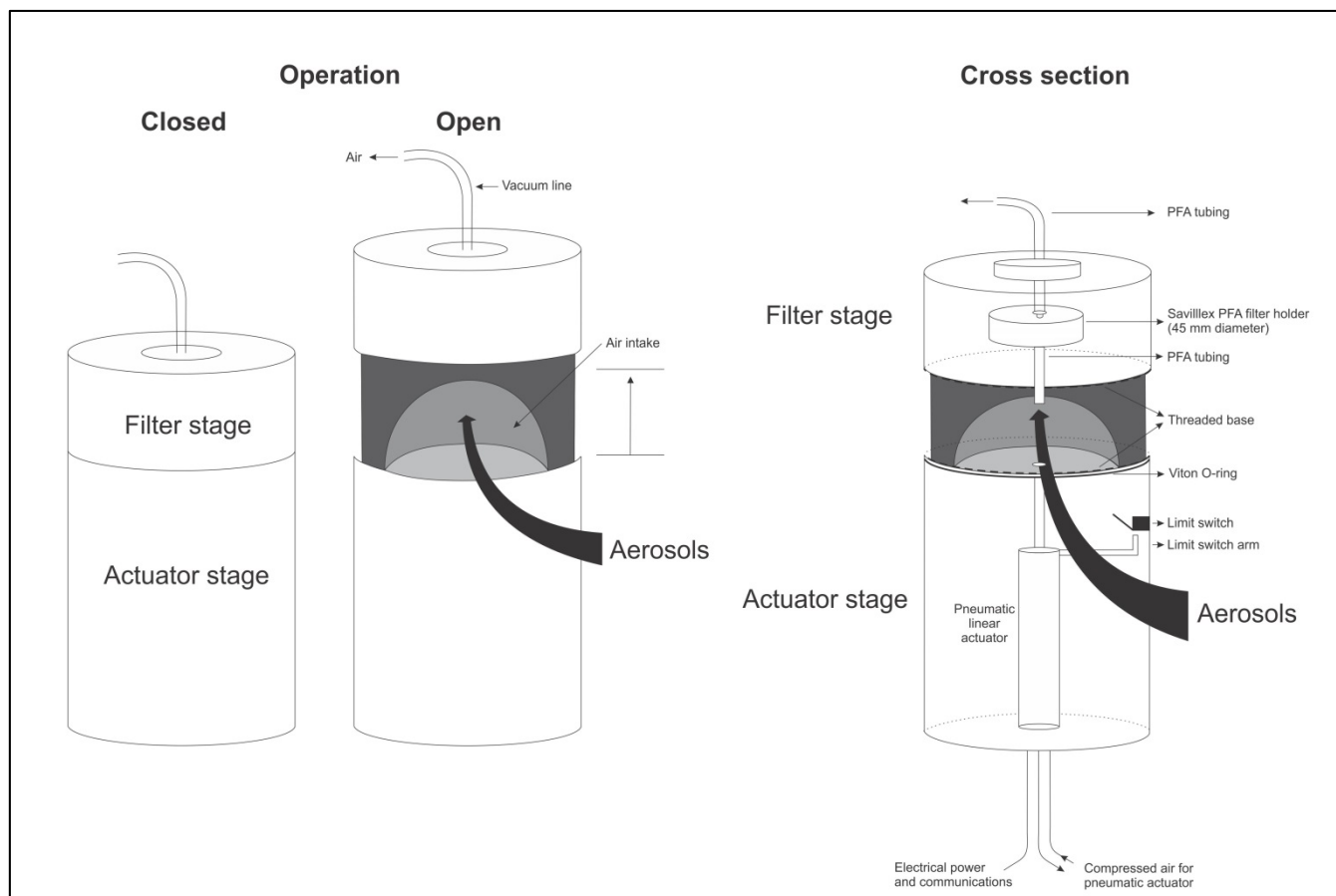
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Figure S1: Diagram to illustrate the hermetic seal of the Bollhöfer et al. (2005) aerosol sampler. Baseline conditions trigger the actuator to open the air intake. When the winds go out of the baseline sector, the air intake closes to minimise passive deposition of particles onto the filter during non-baseline conditions.

1 **Table S1: Recovery rates of total trace metals in certified reference materials (CRM).**

<b>CRM recovery %</b>	<b>Al</b>	<b>±</b>	<b>Ti</b>	<b>±</b>	<b>V</b>	<b>±</b>	<b>Mn</b>	<b>±</b>	<b>Fe</b>	<b>±</b>	<b>Pb</b>	<b>±</b>
Marine sediment (MESS-3)	112	8	92	9	100	9	97	11	108	8	103	11
Trace metal on filter (TMF)	n/d		n/d		101	8	100	9	99	7	107	8

**Table S2: Instrument conditions and measurement parameters**

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Instrument	HR-ICPMS, Element XR (ThermoFisher, Germany)
Torch	Precision type, quartz O-ring free, PFA injector (Element Scientific Inc.; ESI)
Spray chamber	Leachates: APEX with quartz spray chamber (ESI) Digests: PC <sup>3</sup> chilled cyclonic spray chamber (ESI)
Nebuliser	ST micro centric PFA (ESI)
RF power (W)	~1350
Cool gas flow (L min <sup>-1</sup> )	~16
Auxiliary gas flow (L min <sup>-1</sup> )	~0.7
Sample gas flow (L min <sup>-1</sup> )	~0.7
Additional gas (L min <sup>-1</sup> )	Leachates: ~0.2 N <sub>2</sub> Digests: N/A
Additional gas (L min <sup>-1</sup> )	~~0.4 Ar
Guard electrode	Activated
Sample uptake	90 s (Seafast II pump auto-sampler with fast 3 sample injection valve)
Sample rinse	Leachates: 30 s, 3 % or 0.4 mol L <sup>-1</sup> HCl Digests: 50 s, 3 % 0.5 or mol L <sup>-1</sup> HNO <sub>3</sub>
Scan type	E-scan
Isotopes monitored in low resolution ( $m/\Delta m$ ~400)	<sup>208</sup> Pb
Isotopes monitored in medium resolution ( $m/\Delta m$ ~4000)	<sup>27</sup> Al, <sup>47</sup> Ti, <sup>51</sup> V, <sup>55</sup> Mn, <sup>56</sup> Fe

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## References

Bollhöfer, A., Rosman, K. J. R., Dick, A. L., Chisholm, W., Burton, G. R., Loss, R. D., and Zahorowski, W.: Concentration, isotopic composition, and sources of lead in Southern Ocean air during 1999/2000, measured at the Cape Grim Baseline Air Pollution Station, Tasmania, *Geochimica et Cosmochimica Acta*, 69, 4747-4757, 2005.