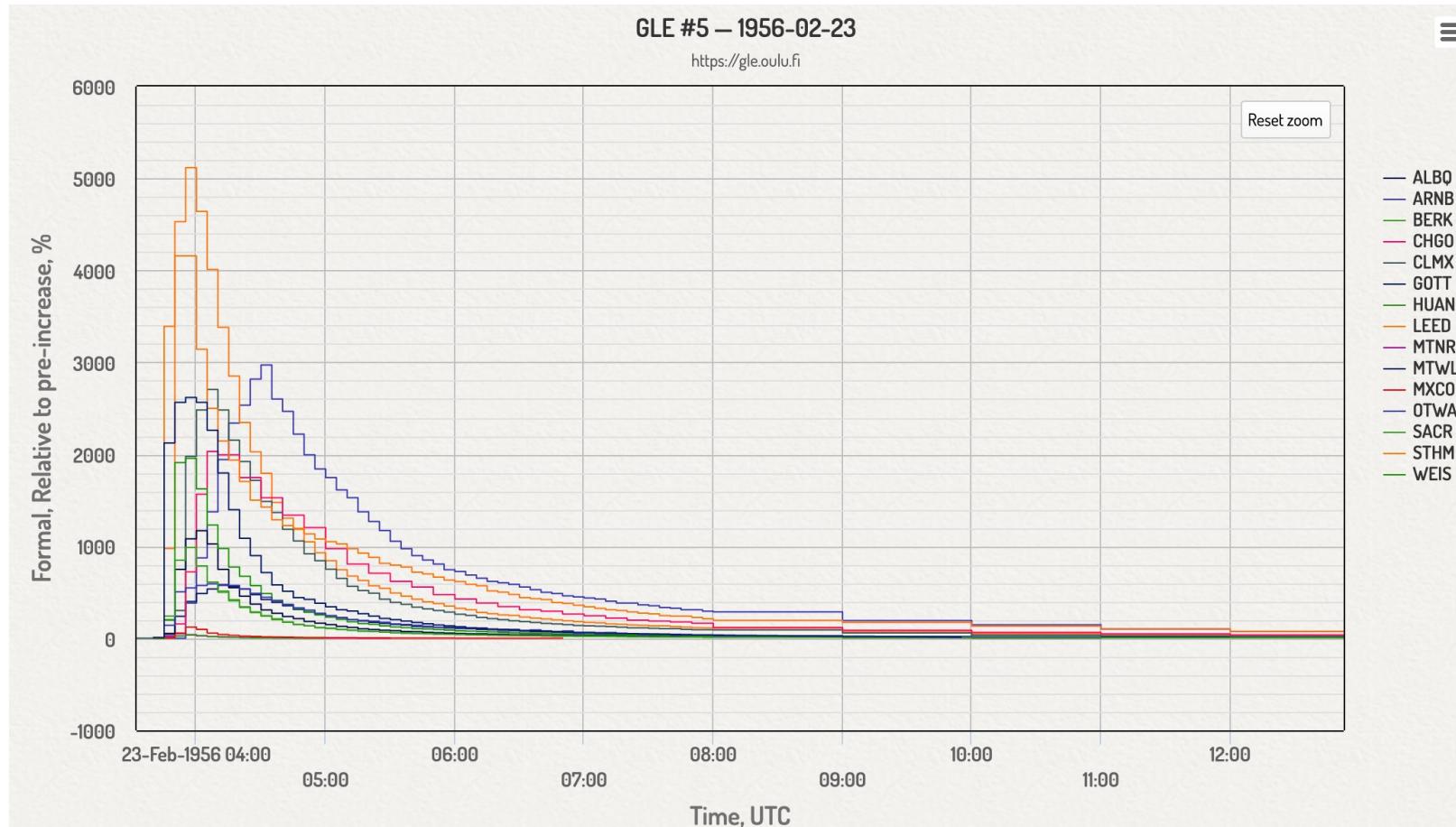


Multiproxy reconstructions of the energy spectra for extreme solar particle events

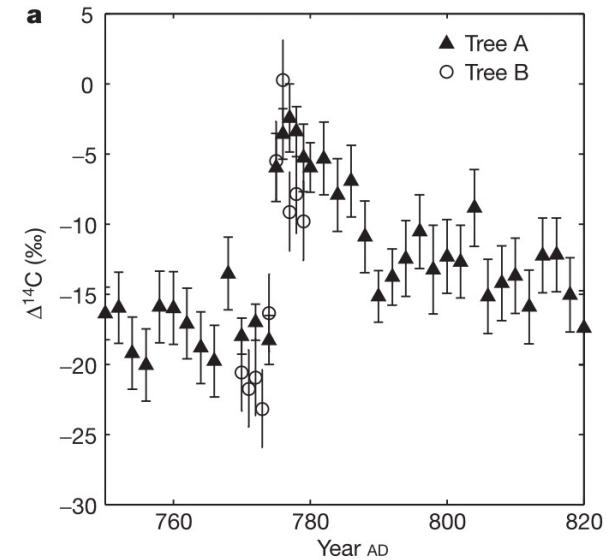
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University of Oulu, Finland

Solar particle events

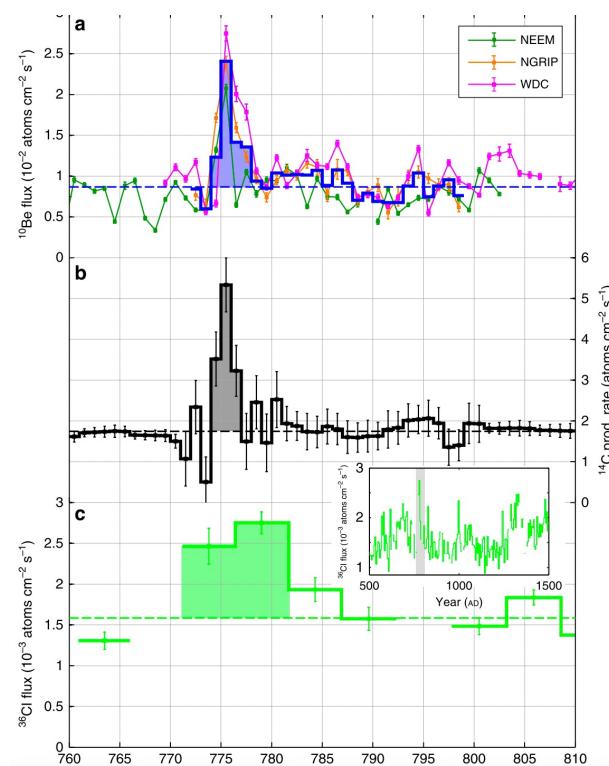


Extreme solar particle events

Miyake et al. 2012



Mekhaldi et al. 2015



Event	M_K	M_P	ϕ, MV	Data	Type	^{10}Be	^{36}Cl	^{14}C
994AD	10.3 ± 0.4	9 ± 0.5	412 ± 40	M15	P	1.2 ± 0.2	2.6 ± 0.3	2.4 ± 0.7
				M15	Q	$(3.9 \pm 0.5) \cdot 10^5$	$(1.3 \pm 0.1) \cdot 10^5$	$(1.2 \pm 0.4) \cdot 10^7$
				B18	P			1.8 ± 0.4
				B18	Q			$(1.0 \pm 0.1) \cdot 10^6$
				B22	Q			$(1.2 \pm 0.1) \cdot 10^7$
775AD	10.7 ± 0.4	9.3 ± 0.5	690 ± 50	M15	P	3.4 ± 0.3	6.3 ± 0.4	3.9 ± 0.7
				M15	Q		$(3.2 \pm 0.2) \cdot 10^5$	$(2.2 \pm 0.4) \cdot 10^7$
				B18	P			3.2 ± 0.2
				B18	Q			$(1.9 \pm 0.1) \cdot 10^6$
				M21	P	3.0 ± 0.2		
				B22	Q			$(2.2 \pm 0.1) \cdot 10^6$
660BC	11.4 ± 0.6	9 ± 0.4	390 ± 50	O19	P	3.7 ± 1.2	6.4 ± 1.4	
				S19	Q			$(1.4 \pm 0.1) \cdot 10^7$
				B22	Q			$(1.6 \pm 0.2) \cdot 10^7$
				P22	P	2.5 ± 0.9		
7176BC	8.7 ± 1.7	7.5 ± 0.4	550 ± 100	P22	P	3.7 ± 0.4	6.1 ± 1.2	4.5 ± 0.5
				B22	Q			$(2.4 \pm 0.1) \cdot 10^6$

Extreme solar particle events fluence reconstruction

