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Multicentennial to millennial-scale changes in the East Asian summer monsoon during Greenland interstadial 25

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Table 1 Uranium and thorium isotopic compositions and ^{230}Th ages for stalagmites L4 and LH36 by MC- ICP-MS.

ID/ Depth(mm)	^{238}U 10^{-6}g/g^a	^{232}Th 10^{-9}g/g	$\delta^{234}\text{U}$ measured ^a	$^{230}\text{Th}/^{238}\text{U}$ activity ^c	$^{230}\text{Th}/^{232}\text{Th}$ atomic ($\times 10^{-3}$)	Age (ka BP) uncorrected	Age (ka BP) corrected ^{c,d}	$\delta^{234}\text{U}$ initial ^b
LH36-27	0.1335±0.0002	1.3±0.006	2113±4	0.875±0.003	1.479±0.008	34.6±0.1	34.6±0.1	2329±5
LH36-33	0.2334±0.0003	0.281±0.006	1922±3	0.822±0.002	11.26±0.24	34.7±0.1	34.6±0.1	2120±3
LH36-37*	0.1619±0.0001	2.6±0.02	1571±2	0.839±0.002	0.861±0.008	41.2±0.1	41.1±0.1	1765±3
LH36-51	0.9751±0.0001	2.1±0.01	1474±3	0.825±0.003	0.635±0.003	42.4±0.2	42.1±0.2	1660±3
LH36-80*	0.1346±0.0001	21.3±0.11	1630±1	0.956±0.002	0.100±0.001	46.8±0.1	45.2±0.8	1851±5
LH36-80	0.0956±0.0001	8.0±0.03	1630±3	0.929±0.006	0.183±0.001	45.3±0.4	44.4±0.5	1849±5
LH36-95	0.1026±0.0001	11.5±0.05	1196±4	0.842±0.006	0.124±0.001	50.3±0.5	49.0±0.8	1373±5
LH36-98*	0.0924±0.0001	10.7±0.06	1664±2	1.073±0.003	0.153±0.001	53.0±0.2	51.9±0.6	1926±4
LH36-113	0.1569±0.0002	8.1±0.03	2478±4	1.400±0.007	0.448±0.003	52.7±0.3	52.2±0.4	2873±6
LH36-127	0.1409±0.0002	11.6±0.06	1500±3	1.021±0.007	0.205±0.002	54.1±0.5	53.2±0.6	1743±5
LH36-147	0.2570±0.0004	10.7±0.04	991±3	0.899±0.005	0.356±0.002	61.9±0.4	61.4±0.5	1179±4
LH36-154	0.1546±0.0002	66.4±0.3	2139±5	2.12±0.02	0.081±0.001	104.8±1.7	101.8±2.2	2851±19
LH36-157	0.3371±0.0004	0.764±0.006	850±3	1.244±0.002	9.05±0.07	108.9±0.4	108.8±0.4	1156±4
LH36-158	0.314±0.001	2.53±0.01	852±7	1.243±0.006	2.55±0.01	108±1	108±1	1157±11
LH36-170	0.2993±0.0004	7.39±0.01	903±3	1.281±0.005	0.856±0.004	108.7±0.8	108.3±0.8	1226±5
LH36-175	0.2663±0.0004	5.16±0.01	823±4	1.227±0.006	1.045±0.005	109.2±0.9	108.9±0.9	1119±6
LH36-195	0.2849±0.0004	8.17±0.02	874±2	1.280±0.007	0.736±0.004	111.4±0.9	111.0±0.9	1195±4
LH36-197	0.2790±0.0004	3.401±0.009	853±4	1.256±0.004	1.700±0.006	110.2±0.7	110.0±0.7	1164±7
LH36-202	0.2711±0.0007	5.37±0.01	844±6	1.251±0.005	1.042±0.004	110.5±0.9	110.2±0.9	1152±8
LH36-204	0.2543±0.0006	4.68±0.01	844±5	1.255±0.005	1.126±0.005	111.0±0.9	110.7±0.9	1153±7
L4-10	1.618±0.003	0.056±0.004	2612±6	2.557±0.006	1209±88	111.6±0.5	111.6±0.5	3579±10
L4-32	1.969±0.003	0.009±0.005	2547±8	2.520±0.006	9576±5084	112.4±0.5	112.3±0.5	3497±12
L4-48	1.830±0.004	0.010±0.005	2624±10	2.588±0.006	7840±3793	113.1±0.7	113.0±0.7	3611±16
L4-79	2.403±0.006	0.047±0.004	2472±7	2.478±0.008	2101±188	113.3±0.7	113.2±0.7	3404±12
L4-93	1.657±0.003	0.041±0.005	2581±6	2.569±0.006	1724±195	114.0±0.5	113.9±0.5	3561±10
L4-102	1.368±0.002	0.005±0.005	2674±5	2.637±0.004	12533±12968	113.9±0.4	113.9±0.4	3688±8
L4-111	1.055±0.002	0.097±0.005	2659±6	2.633±0.007	471±22	114.4±0.6	114.3±0.6	3673±10
L4-114	1.002±0.001	0.036±0.005	2646±5	2.630±0.004	1206±156	114.9±0.4	114.8±0.4	3659±8
L4-117	1.248±0.002	5.925±0.010	1952±4	2.852±0.006	9.91±0.02	198±1	197±1	3410±13

Analytical errors are 2σ of the mean.

^a $[^{238}\text{U}] = [^{235}\text{U}] \times 137.818 (\pm 0.65\%)$ (Hiess et al., 2012); $\delta^{234}\text{U} = ([^{234}\text{U}/^{238}\text{U}]_{\text{activity}} - 1) \times 1000$.

^b $\delta^{234}\text{U}_{\text{initial}}$ corrected was calculated based on ^{230}Th age (T), i.e., $\delta^{234}\text{U}_{\text{initial}} = \delta^{234}\text{U}_{\text{measured}} \times e^{\lambda_{234} \times T}$, T is corrected age.

^c $[^{230}\text{Th}/^{238}\text{U}]_{\text{activity}} = 1 - e^{-\lambda_{230}T} + (\delta^{234}\text{U}_{\text{measured}}/1000)[\lambda_{230}/(\lambda_{230} - \lambda_{234})](1 - e^{-(\lambda_{230} - \lambda_{234})T})$, where T is the age.

Decay constants are $9.1705 \times 10^{-6} \text{ yr}^{-1}$ for ^{230}Th , $2.8221 \times 10^{-6} \text{ yr}^{-1}$ for ^{234}U (Cheng et al., 2013), and $1.55125 \times 10^{-10} \text{ yr}^{-1}$ for ^{238}U (Jaffey et al., 1971)

^dAge corrections, relative to before 1950 AD, were calculated using an estimated atomic $^{230}\text{Th}/^{232}\text{Th}$ atomic ratio of $4 \pm 2 \times 10^{-6}$.

Those are the values for material at secular equilibrium, with the crustal $^{232}\text{Th}/^{238}\text{U}$ value of 3.8. The errors are

arbitrarily assumed to be 50%.

The samples with a star (*) are measured by the Nanjing Normal University Isotope Laboratory.