

1 **Supplementary materials and figures**

2 Supplementary Table 1: U-series ages added to this publication from DH2 core D (+1.8 m r.m.w.t.).
 3 Uncertainties are 2σ. U decay constants: λ₂₃₈ = 1.55125 × 10⁻¹⁰ (Jaffey et al., 1971) and λ₂₃₄ =
 4 2.82206 × 10⁻⁶ (Cheng et al., 2013). Th decay constant: λ₂₃₀ = 9.1705 × 10⁻⁶ (Cheng et al., 2013).
 5 Dft* = distance from top. **δ²³⁴U = ([²³⁴U/²³⁸U]_{activity} - 1) × 1000. *** δ²³⁴U_{initial} was calculated based
 6 on ²³⁰Th age (T), i.e., δ²³⁴U_{initial} = δ²³⁴U_{measured} × e^{λ₂₃₄ × T}. Corrected ²³⁰Th ages assume the initial
 7 ²³⁰Th/²³²Th atomic ratio of 4.4 ± 2.2 × 10⁻⁶. Those are the values for a material at secular equilibrium,
 8 with the bulk earth ²³²Th/²³⁸U value of 3.8. The errors are arbitrarily assumed to be 50 %. ****BP
 9 stands for "Before Present" where the "Present" is defined as the year 1950 A.D.
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Dft* (mm)	²³⁸ U (ppb)	²³² Th (ppt)	²³⁰ Th / ²³² Th (atomic x10 ⁻⁶)	δ ²³⁴ U** (measured)	²³⁰ Th / ²³⁸ U (activity)	²³⁰ Th Age (a) (uncorrected)	²³⁰ Th Age (a) (corrected)	d ²³⁴ U _{initial} *** (corrected)	²³⁰ Th Age (a) (corrected BP****)
351.00	526.4 ±0.5	641.3 ± 12.9	24552 ±496	651.9 ±1.7	1.8140 ±0.0026	365414 ±3752	365400 ±3751	1828.1 ±19.9	365300 ±3800
426.00	651.0 ±0.7	889.3 ± 18.0	20293 ±411	516.6 ±1.6	1.6812 ±0.0026	436257 ±7414	436239 ±7413	1769.4 ±37.5	436200 ±7400
494.00	485.5 ±0.5	37.7 ± 2.5	342178 ±22387	448.9 ±1.7	1.6118 ±0.0021	502881 ±12006	502875 ±12006	1855.4 ±63.3	503000 ±12000
519.80	447.5 ±0.1	192.1 ± 0.1	61314 ±159	437.8 ±0.7	1.5965 ±0.0020	503197 ±8473	503206 ±8474	1811.2 ±43.4	503100 ±8500
534.80	531.7 ±0.1	199.4 ± 0.1	68374 ±154	402.8 ±0.4	1.5552 ±0.0015	536546 ±8616	536561 ±8617	1830.8 ±44.6	536500 ±8600
542.40	532.9 ±0.1	177.6 ± 0.1	76673 ±207	397.2 ±0.4	1.5496 ±0.0019	548883 ±11904	548900 ±11906	1869.4 ±62.9	549000 ±12000
562.00	389.6 ±0.4	31.8 ± 2.1	306762 ±19876	373.5 ±1.7	1.5191 ±0.0021	565805 ±21928	565795 ±21927	1844.0 ±114.9	566000 ±19000
569.40	320.0 ±0.3	53.2 ± 2.0	149855 ±5625	366.2 ±1.7	1.5102 ±0.0024	575443 ±25308	575431 ±25307	1857.6 ±133.7	575000 ±37000
583.40	542.6 ±0.6	35.4 ± 2.7	375952 ±29151	349.0 ±1.7	1.4877 ±0.0027	590019 ±30745	590007 ±30743	1844.5 ±161.6	590000 ±31000
608.20	76.7 ±0.1	19.4 ± 1.7	89710 ±8042	262.7 ±1.7	1.3780 ±0.0035	secular equilibrium (>600 ka)			
611.80	496.6 ±0.5	28.9 ± 2.2	389968 ±29610	262.1 ±1.9	1.3772 ±0.0022	secular equilibrium (>600 ka)			
618.20	306.2 ±0.5	98.8 ± 3.0	86422 ±2637	257.7 ±2.2	1.6921 ±0.0042	secular equilibrium (>600 ka)			
623.40	320.9 ±0.5	83.6 ± 2.6	86504 ±2746	247.6 ±1.6	1.3662 ±0.0031	secular equilibrium (>600 ka)			
625.60	335.7 ±0.5	110.6 ± 3.6	86550 ±2808	245.6 ±2.0	1.7299 ±0.0040	secular equilibrium (>600 ka)			
630.00	404.0 ±0.4	1021.3 ± 20.5	8746 ±176	241.0 ±1.5	1.3407 ±0.0021	secular equilibrium (>600 ka)			
634.00	366.2 ±0.5	109.9 ± 3.0	86174 ±2331	232.7 ±1.7	1.5685 ±0.0034	secular equilibrium (>600 ka)			
638.00	480.6 ±0.6	311.3 ± 6.4	33860 ±697	229.4 ±1.5	1.3301 ±0.0022	secular equilibrium (>600 ka)			
639.80	353.5 ±0.6	94.9 ± 3.7	86950 ±3381	228.9 ±1.9	1.4160 ±0.0034	sec. equilib. (>600 ka)			
652.00	353.4 ±0.5	110.3 ± 4.1	86852 ±3236	229.4 ±1.8	1.6443 ±0.0038	sec. equilib. (>600 ka)			

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12 Supplementary Table 2: Calculated ²³⁴U age using statistically derived (SD) δ²³⁴U_i. BP stands for
 13 Before Present where the "Present" is defined as the year 1950 A.D.
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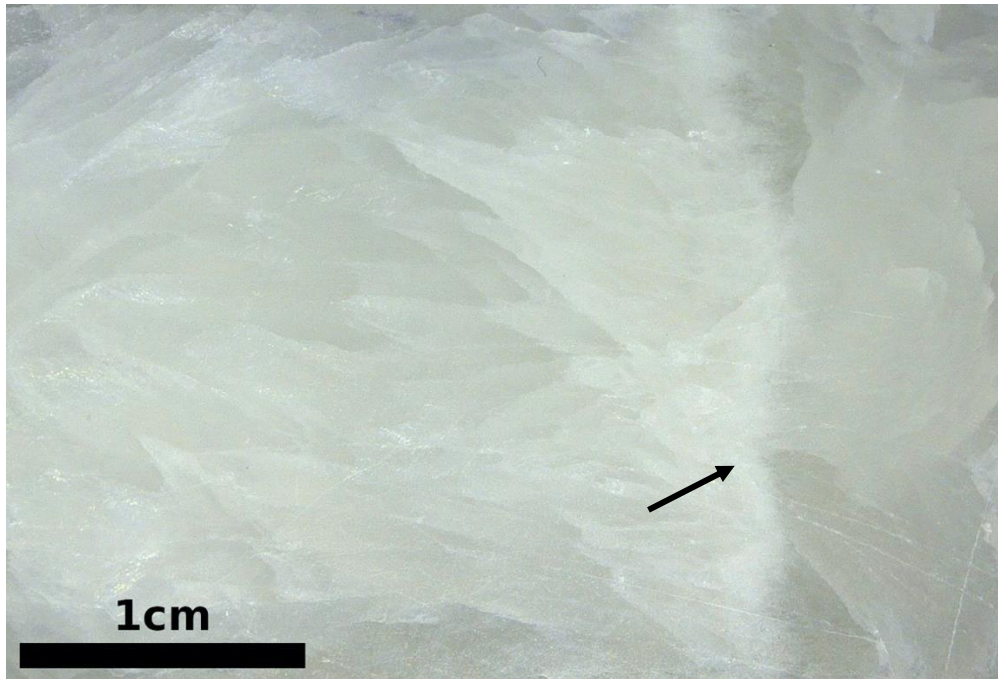
Depth (mm)	δ ¹⁸ O (‰, VPDB)	δ ¹³ C (‰, VPDB)	δ ²³⁴ U _{meas} (‰) (2σ)	²³⁰ Th-derived δ ²³⁴ U _i (‰) (2σ)	SD δ ²³⁴ U _i (‰) (2σ)	²³⁰ Th Age BP (a BP) (2σ)	²³⁴ U Age BP (a BP) (2σ)
0	-15.72	-2.19	1,716.9 ± 2.4	1741 ± 2	1727 ± 61	4890 ± 45	1800 ± 12900
0.9	-16.06	-2.30	1,713.2 ± 2.4	1752 ± 2	1732 ± 61	7940 ± 75	3700 ± 12800
2.3	-16.12	-2.36	1,707.5 ± 2.8	1747 ± 3	1730 ± 61	8020 ± 85	4300 ± 13000
2.6	-16.13	-2.34	1,705.1 ± 2.3	1744 ± 2	1732 ± 61	8010 ± 100	5300 ± 12900
3.2	-16.03	-2.25	1,706.3 ± 2.1	1750 ± 2	1736 ± 61	8810 ± 40	5800 ± 12800
3.8	-16.50	-2.12	1,705.4 ± 2.5	1769 ± 3	1768 ± 61	12920 ± 95	12500 ± 12700
4	-16.39	-2.02	1,675.7 ± 2.9	1808 ± 3	1771 ± 61	26820 ± 150	19300 ± 12700
5.8	-16.62	-2.07	1,714.5 ± 2.4	1851 ± 3	1777 ± 61	27040 ± 140	12400 ± 12600
7	-16.77	-1.95	1,667.6 ± 2.2	1813 ± 2	1794 ± 61	29500 ± 120	25500 ± 12400
10.2	-16.62	-2.02	1,641.7 ± 2.5	1811 ± 3	1781 ± 61	34710 ± 150	28700 ± 12600
14.8	-16.55	-1.79	1,612.1 ± 2.6	1822 ± 3	1798 ± 61	43240 ± 190	38500 ± 12500
18.9	-16.46	-1.82	1,572.9 ± 2.2	1813 ± 3	1792 ± 61	50260 ± 130	45900 ± 12500
22.4	-16.77	-1.89	1,540.8 ± 2.3	1799 ± 3	1799 ± 61	54760 ± 160	54700 ± 12500
25.9	-16.82	-1.72	1,513.9 ± 2.4	1793 ± 3	1815 ± 61	59840 ± 170	64100 ± 12400
29.9	-16.78	-1.56	1,502.8 ± 2.2	1796 ± 3	1827 ± 61	63060 ± 160	69000 ± 12300
33.9	-16.64	-1.73	1,483.9 ± 2.3	1800 ± 3	1807 ± 61	68400 ± 180	69500 ± 12400
37.2	-16.33	-1.82	1,454.0 ± 2.4	1788 ± 3	1786 ± 61	73200 ± 200	72600 ± 12600
40.8	-16.29	-1.73	1,428.8 ± 2.3	1777 ± 3	1791 ± 61	77180 ± 200	79800 ± 12500
44.6	-15.98	-1.82	1,395.5 ± 2.3	1765 ± 3	1770 ± 61	83080 ± 270	84000 ± 12700
49.8	-16.49	-1.80	1,365.7 ± 2.7	1751 ± 4	1794 ± 61	88070 ± 340	96400 ± 12700
53.9	-16.17	-1.82	1,321.1 ± 2.4	1725 ± 4	1779 ± 61	94400 ± 340	105100 ± 12700
57.4	-16.12	-1.93	1,298.0 ± 2.1	1723 ± 3	1767 ± 61	100230 ± 380	109000 ± 12700
59.9	-16.01	-1.97	1,292.7 ± 2.5	1718 ± 4	1758 ± 61	100710 ± 310	108700 ± 12900
61.4	-15.86	-1.87	1,272.5 ± 1.9	1707 ± 3	1760 ± 61	104090 ± 310	114700 ± 12700
65.4	-16.10	-1.96	1,257.9 ± 2.1	1703 ± 3	1763 ± 61	107280 ± 380	119400 ± 12800
69.4	-16.13	-2.03	1,236.7 ± 2.0	1694 ± 3	1759 ± 61	111480 ± 360	124500 ± 12800
77.7	-15.41	-2.20	1,204.8 ± 2.2	1672 ± 4	1712 ± 61	116070 ± 410	124300 ± 13200
97.4	-14.68	-2.78	1,153.2 ± 2.3	1625 ± 4	1630 ± 61	121390 ± 410	122300 ± 13900
99.4	-14.87	-3.01	1,163.2 ± 1.7	1646 ± 3	1618 ± 61	122860 ± 300	116700 ± 13800
101.4	-15.36	-2.88	1,123.2 ± 2.1	1616 ± 4	1651 ± 61	128750 ± 420	136300 ± 13700
102.9	-15.81	-2.44	1,163.1 ± 2.0	1666 ± 3	1709 ± 61	127290 ± 370	136100 ± 13200
104.4	-16.23	-2.31	1,180.7 ± 2.2	1727 ± 4	1739 ± 61	134750 ± 420	137000 ± 13000
105.9	-16.46	-2.40	1,170.6 ± 2.0	1731 ± 4	1742 ± 61	138460 ± 480	140500 ± 12900
107.4	-16.58	-2.41	1,167.5 ± 2.1	1732 ± 4	1746 ± 61	139730 ± 440	142300 ± 12900
108.9	-16.60	-2.47	1,161.6 ± 2.0	1739 ± 4	1741 ± 61	143020 ± 450	143200 ± 12900
109.9	-16.59	-2.44	1,150.4 ± 2.0	1734 ± 4	1744 ± 61	145410 ± 550	147200 ± 12900
114.4	-16.57	-2.19	1,130.4 ± 2.0	1739 ± 4	1765 ± 61	152630 ± 540	157600 ± 12800
117.4	-16.71	-2.10	1,127.8 ± 2.0	1742 ± 4	1779 ± 61	154060 ± 520	161100 ± 12700
117.4	-16.71	-2.10	1,141.0 ± 2.2	1755 ± 4	1779 ± 61	152510 ± 550	157000 ± 12700
119.4	-16.78	-2.18	1,128.9 ± 2.1	1763 ± 5	1774 ± 61	157810 ± 680	159900 ± 12700
124.4	-16.46	-2.20	1,115.4 ± 1.9	1765 ± 4	1758 ± 61	162600 ± 610	161000 ± 12800
128.4	-16.79	-2.34	1,096.3 ± 1.9	1763 ± 5	1761 ± 61	168310 ± 700	167700 ± 12800
132.4	-16.58	-2.11	1,078.6 ± 2.0	1757 ± 5	1772 ± 61	172830 ± 680	175600 ± 12800
137.8	-16.52	-1.80	1,091.3 ± 1.9	1809 ± 5	1795 ± 61	178940 ± 680	176100 ± 12600
141.8	-16.58	-1.90	1,084.0 ± 1.9	1828 ± 5	1789 ± 61	185060 ± 750	177300 ± 12600

145.8	-16.48	-1.81	1,062.9 ± 2.0	1818 ± 6	1793 ± 61	190180 ± 850	185100 ± 12600
150.4	-16.18	-1.80	1,050.4 ± 2.1	1816 ± 6	1781 ± 61	193880 ± 900	186800 ± 12800
153	-16.06	-1.89	1,050.0 ± 2.0	1823 ± 6	1768 ± 61	195360 ± 830	184400 ± 12800
153	-16.06	-1.89	1,045.9 ± 2.1	1825 ± 6	1768 ± 61	197200 ± 970	185800 ± 12900
155.4	-16.19	-2.03	1,024.8 ± 2.2	1794 ± 6	1761 ± 61	198430 ± 940	191600 ± 13000
158.4	-16.22	-1.96	1,012.1 ± 1.9	1802 ± 6	1768 ± 61	204300 ± 920	197500 ± 12800
200.2	-15.91	-2.08	957.2 ± 1.9	1770 ± 7	1745 ± 61	217700 ± 1300	212400 ± 13000
205.6	-16.56	-2.13	939.2 ± 2.1	1748 ± 9	1769 ± 61	220000 ± 1700	224100 ± 12900
208.6	-16.72	-2.09	921.7 ± 2.2	1745 ± 9	1780 ± 61	226100 ± 1600	233000 ± 12900
230	-15.69	-2.28	889.0 ± 2.0	1742 ± 9	1718 ± 61	238300 ± 1700	233200 ± 13300
231.2	-15.74	-2.41	877.1 ± 1.9	1736 ± 9	1709 ± 61	241900 ± 1700	236000 ± 13300
231.6	-15.83	-2.39	878.3 ± 2.0	1725 ± 8	1715 ± 61	239200 ± 1500	236800 ± 13300
233.4	-16.37	-2.20	872.3 ± 2.1	1757 ± 9	1755 ± 61	248200 ± 1500	247400 ± 13100
233.4	-16.37	-2.20	873.2 ± 2.0	1764 ± 10	1755 ± 61	249200 ± 1800	247000 ± 13000
237	-16.62	-2.01	863.9 ± 2.0	1773 ± 11	1782 ± 61	254700 ± 2000	256300 ± 12900
239.6	-16.79	-2.02	842.4 ± 1.9	1805 ± 12	1788 ± 61	269900 ± 2100	266500 ± 12800
246.2	-16.91	-1.73	837.6 ± 2.1	1835 ± 13	1819 ± 61	277900 ± 2400	274600 ± 12700
248.4	-16.50	-1.83	826.7 ± 2.1	1801 ± 14	1792 ± 61	275800 ± 2600	274000 ± 12900
254.2	-16.11	-2.01	800.9 ± 1.9	1810 ± 13	1759 ± 61	288900 ± 2500	287800 ± 13000
263.8	-16.62	-1.66	768.7 ± 2.0	1792 ± 14	1812 ± 61	299900 ± 2600	303500 ± 12800
271.8	-16.11	-1.90	742.5 ± 1.8	1776 ± 14	1768 ± 61	309000 ± 2700	307200 ± 13000
281.8	-16.11	-1.97	717.2 ± 1.8	1768 ± 16	1763 ± 61	319600 ± 3000	318400 ± 13100
287.4	-16.09	-1.91	707.7 ± 2.9	1752 ± 27	1768 ± 61	321200 ± 5300	324100 ± 13600
291.8	-15.99	-2.03	695.3 ± 1.8	1734 ± 16	1752 ± 61	323800 ± 3200	327200 ± 13200
300	-15.51	-2.03	692.4 ± 1.8	1746 ± 19	1731 ± 61	327700 ± 3800	324500 ± 13300
325	-15.17	-2.25	668.7 ± 1.9	1745 ± 23	1697 ± 61	339800 ± 4500	329800 ± 13600
328.4	-15.11	-2.28	666.1 ± 1.7	1678 ± 13	1692 ± 61	327300 ± 2600	330000 ± 13600
329.4	-15.26	-2.51	660.0 ± 2.0	1705 ± 18	1679 ± 61	336300 ± 3600	330700 ± 13900
330.6	-15.43	-2.49	659.3 ± 2.0	1731 ± 22	1688 ± 61	341900 ± 4300	332900 ± 13800
331.6	-15.42	-2.41	671.1 ± 1.9	1790 ± 28	1694 ± 61	347700 ± 5500	327900 ± 13700
333	-16.21	-2.25	659.8 ± 1.8	1796 ± 18	1743 ± 61	354700 ± 3400	344000 ± 13300
333.6	-16.49	-2.01	677.2 ± 1.8	1780 ± 25	1776 ± 61	342300 ± 4900	341400 ± 13000
335.4	-16.73	-1.82	672.3 ± 2.2	1768 ± 33	1803 ± 61	342600 ± 6500	349300 ± 13000
337.2	-16.88	-1.73	675.5 ± 1.9	1793 ± 28	1818 ± 61	345800 ± 5400	350500 ± 12800
344	-17.37	-1.70	663.6 ± 1.9	1789 ± 25	1842 ± 61	351400 ± 4800	361500 ± 12600
347.2	-17.26	-1.69	659.8 ± 1.8	1796 ± 18	1837 ± 61	354700 ± 3400	362600 ± 12600
351	-17.05	-1.67	651.9 ± 1.7	1828 ± 20	1830 ± 61	365300 ± 3800	365500 ± 12600
354	-16.92	-1.67	648.8 ± 2.2	1845 ± 35	1825 ± 61	370300 ± 6600	366100 ± 12900
355	-16.72	-1.70	644.7 ± 1.7	1851 ± 32	1813 ± 61	373700 ± 6000	366100 ± 12800
356.8	-16.60	-1.69	638.3 ± 1.9	1809 ± 33	1809 ± 61	369100 ± 6300	368900 ± 12900
365.8	-16.78	-1.64	620.2 ± 1.9	1819 ± 31	1821 ± 61	381200 ± 5900	381300 ± 12900
374.8	-16.36	-1.79	604.2 ± 1.8	1824 ± 35	1789 ± 61	391400 ± 6800	384400 ± 13000
377.2	-16.49	-1.89	600.8 ± 1.3	1746 ± 19	1786 ± 61	377900 ± 3800	385900 ± 12800
381	-16.31	-1.92	589.6 ± 2.4	1794 ± 30	1777 ± 61	394300 ± 5800	390600 ± 13500
390.4	-15.84	-1.84	578.7 ± 1.8	1728 ± 31	1762 ± 61	387500 ± 6300	394300 ± 13300
400.8	-16.24	-1.98	552.3 ± 1.8	1716 ± 33	1767 ± 61	401600 ± 6800	411900 ± 13300
405.4	-15.37	-2.07	554.3 ± 0.8	1749 ± 15	1722 ± 61	407100 ± 3100	401300 ± 13000
408.4	-15.36	-2.11	551.0 ± 1.7	1702 ± 34	1718 ± 61	399700 ± 6900	402600 ± 13600
417	-15.67	-2.31	531.5 ± 1.7	1746 ± 39	1714 ± 61	421400 ± 7900	414700 ± 13600
420.8	-15.90	-2.49	519.9 ± 1.6	1743 ± 43	1709 ± 61	428600 ± 8700	421500 ± 13700
422.4	-16.03	-2.51	514.1 ± 1.9	1733 ± 46	1714 ± 61	430600 ± 9200	426300 ± 13800
423.6	-16.36	-2.38	511.4 ± 1.7	1683 ± 41	1739 ± 61	422100 ± 8500	433300 ± 13500
424.6	-16.57	-2.40	515.0 ± 1.9	1640 ± 30	1746 ± 61	410300 ± 6300	432400 ± 13600
426	-16.59	-2.41	516.6 ± 1.6	1769 ± 37	1746 ± 61	436100 ± 7400	431300 ± 13400
439.9	-16.84	-2.04	506.8 ± 1.8	1801 ± 59	1789 ± 61	449200 ± 11500	446800 ± 13300
465.2	-16.14	-1.68	487.8 ± 1.0	1806 ± 49	1789 ± 61	475500 ± 6900	460100 ± 12700
475	-15.95	-1.85	471.7 ± 1.9	1808 ± 58	1767 ± 61	475900 ± 11400	467600 ± 13600
494	-15.62	-2.10	485.5 ± 0.5	1855 ± 63	1730 ± 61	502800 ± 12000	477800 ± 13700
519.8	-15.89	-1.81	437.8 ± 0.7	1811 ± 43	1767 ± 61	503100 ± 8500	494200 ± 12700
534.8	-16.54	-1.81	402.8 ± 0.4	1831 ± 45	1796 ± 61	536400 ± 8600	529400 ± 12300
542.4	-16.53	-1.66	397.2 ± 0.4	1869 ± 63	1808 ± 61	548800 ± 11900	536800 ± 12300
562	-16.61	-1.65	373.5 ± 1.7	1844 ± 115	1812 ± 61	565700 ± 21900	559400 ± 13400
569.4	-16.13	-1.72	366.2 ± 1.7	1858 ± 134	1785 ± 61	575400 ± 25300	561100 ± 13700
577.8	-15.98	-2.11	360.4 ± 0.6	1748 ± 56	1745 ± 61	559400 ± 11200	558700 ± 12900
583.4	-15.96	-1.77	349.0 ± 1.7	1845 ± 162	1774 ± 61	589900 ± 30700	575800 ± 13800

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19 Supplementary figure 1: Polished core slab (growth direction from right to left) showing the hiatus
20 identified at 587.4 mm from the top of core. According to the ^{234}U -derived age model presented in this
21 paper, the growth hiatus spans 67 ka between 578 and 645 ± 22 ka.

22 **Supplementary Material references**

23 Jaffey, A. H., Flynn, K. F., Glendenin, L. E., Bentley, W. T., Essling, A. M., 1971. Precision
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25 1889. <https://doi.org/10.1103/PhysRevC.4.1889>.

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