



New ice dating tools reveal 1.2 Ma old meteoric ice near the base of the Vostok ice core

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In the quest for the oldest Antarctic ice, we revisited the deepest sections of the Vostok core and attempted to date the old stratigraphically disturbed meteoric ice bedded between 3318 and 3538 m using three different dating techniques: a new method based on the phenomenon of air-hydrate crystal growth in polar ice, ^{81}Kr radiometric dating, and by measuring the $^{40}\text{Ar}/^{38}\text{Ar}$ isotope ratio in trapped air. Our study provides a strong indication that at the bottom section of the Vostok core (3500-3538 m) the age of meteoric ice reaches 1.2 Ma. The existence of ice older than 1 million years in the vicinity of Vostok implies that upstream of the station, in the area around Dome B, even older ice, with undisturbed stratigraphy, may exist. This makes Dome B an appropriate target for further dedicated investigations aimed at locating the formation site of the old ice discovered in the Vostok core.