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ACC29-02 Room:301A Time:May 26 14:30-14:45

Estimation of the age-depth relationship of Dome Fuji Ice Core using a sequential Bayesian approach

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We have developed a method for estimating the age as a function of depth in Domu Fuji Ice Core and evaluating its uncertainty. The age–depth relationship is mainly determined by the accumulation of snow at the site of the ice core and the thinning process due to the horizontal stretching and vertical compression of the ice layer. However, since neither the accumulation process nor the thinning process are fully understood, it is essential to incorporate observational information into a model that describes the accumulation and thinning processes. In the proposed technique, the age as a function of depth is estimated from age markers and delta-O-18 data. The estimation is achieved using the particle Markov chain Monte Carlo method, in which the sequential Monte Carlo method is combined with the Markov chain Monte Carlo method. The performance of the proposed technique is demonstrated by applying it to ice core data from Dome Fuji in Antarctica.

Keywords: ice core, dating method, Bayesian estimation