

Japan Geoscience Union Meeting 2011

(May 22-27 2011 at Makuhari, Chiba, Japan)

©2011. Japan Geoscience Union. All Rights Reserved.



ACC029-15

Room:102

Time:May 26 17:00-17:15

Dating of a Dome Fuji (Antarctica) shallow ice core by volcanic signal matching with B32 and EDML1/EDC3 chronologies

Yuko Motizuki^{1*}, Yoichi Nakai¹, Kazuya Takahashi¹, Makoto Igarashi², Hideaki Motoyama², Keisuke Suzuki³

¹RIKEN Nishina Center, ²NIPR, ³Shinshu Univ.

We used volcanic signature matching between the DF01 shallow ice core from Dome Fuji (Dome F) and the B32 ice core from Dronning Maud Land, East Antarctica, to transfer the B32 chronology constructed by annual layer counting and the top part of the correlated EDML1/EDC3 chronology to the portion of the DF01 core between 1900 and 1 AD. Matching was done by careful comparison of non-sea-salt sulfate (nssSO_4^{2-}) data, which have a temporal resolution of about 1 year, between the DF01 and B32 cores. Synchronization of the volcanic signatures was extremely good, enabling us to date the DF01 core, in particular the part before the last ~800 years, which has been difficult before this.

In total, 31 volcanic eruptions were synchronized between 1900 and 180 AD, and 4 volcanic eruption dates from EDML1/EDC3 chronology were additionally used for a tentative dating of the DF01 core until 1 AD. The newly obtained chronologies are called DFS1 (transferred from the B32 chronology) and DFS2 (transferred from EDML1/EDC3 chronology). We found that the mean accumulation rate between the synchronized volcanic horizons of the Dome F relative to that at the B32 core drilling site does not differ significantly over the past ~1700 years, adding further confidence on the matching approach. We also determined the absolute mean accumulation rates at Dome F from 1900 AD back to 1 AD.

Keywords: ice core, Dome Fuji, core dating