

Dating of the very deep part of the Dome Fuji Station ice core

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We examined the age of Dome Fuji ice core at depths below about 2500 m down to 3028.52 m. This depth range is a part which was drilled by the drilling efforts since 2003. Initial dating for this part was done by comparing stable isotope ratio profiles from the Dome Fuji ice core with those from the EPICA Dome C ice core. The EPICA Dome C ice core has its own dating based on ice flow modeling and ice core data. At the initial stage of the ice core studies, for Dome Fuji ice core, dating of the EPICA Dome C ice core is the first reliable reference to get an estimate of the age. By comparison, it was derived that the 3028.52 m-deep ice, deepest ice until December 2006 at Dome Fuji, was as old as about 720 kyrs BP. Looking at the inferred depth-age relationship in the Dome Fuji ice core, we observed that the age was as old as expected from ice flow models down to depth about 2800m. But at deeper depths, the increase in age with depth surprisingly slows down. Such a feature cannot be reproduced with a simple one dimensional model. We suggest that spatially varying geothermal heat flux and induced basal melting of ice are responsible for complex three dimensional effects. But we need more studies to better understand ice flow conditions at the very deep part of the ice sheet. Down to the depth 3028.5 m, we checked that the ice core quality was good and preserves paleoclimate signals such as oxygen isotope ratio. In the Austral summer 2006/2007 season, the drilling team, led by Hideaki Motoyama, extended the drilling down to 3035.22m. We will start efforts to examine the age of the newly drilled parts. Also, more efforts will be done to update dating of the core and interpretation of the ice flow, using ice core data and ice flow models.