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Ten years characteristics of surface mass balance at Dome Fuji, East Antarctica, from 1995 to 2005 by a stake method

T. Kameda (1), H. Motoyama (2), S. Fujita (2) S. Takahashi (1)

(1) Kitami Institute of Technology

(2) National Institute of Polar Research, Research Organization of Information and Systems (ROIS) Kaga, 1-9-10, Itabashi-ku, Tokyo 173-8515 JAPAN

(sfujita@pmg.nipr.ac.jp / Fax: +81-3-3962-5719 / Phone: +81-3-3962-5517)

At Dome Fuji Station in East Antarctica, present day surface mass balance was investigated by a 36-stake method for ten years, from January 1995 to January 2005. We found that the average surface mass balance during the ten years was 23.4 ± 4.7 mm / year in water equivalent. Negative annual surface mass balance occurred at 30 points during the entire period (total 360 points; 36 point x 10 years). It means, at about 8 % of stake points no annual accumulation occurred. This negative surface mass balance at each stake point is compensated by the successive three years' snow accumulation. This observational fact suggests that three years accumulation is the maximum resolution, to which we can confidently rely on for detailed analysis of Dome Fuji ice core from a viewpoint of present day snow accumulation. We suggest that, for deep ice cores retrieved from inland sites of East Antarctica, there may be common limitations, that is, over-amplification or disappearance of short term signals due to inhomogeneous deposition at the surface. We suggest that we must be very careful to interpret ice core events that occur within period of time shorter than a few years.