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Stable isotope content and snow accumulation between 1957/58 and 2007/08 along the ice divide from Kohnen-Station towards Dome Fuji, East Antarctica

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One IPY activity during the 2007/08 Antarctic field season was the Japanese-Swedish Antarctic Expedition (JASE) across Amundsenisen, Dronning Maud Land. The western end of the traverse route was the Swedish base WASA and the eastern end the Japanese base on Dome Fuji. The aim of this traverse was to get more detailed information from this remote part of the Antarctic high plateau and the snow accumulation of the past hundred years.
Various glaciological investigations were carried out. Amongst other things the team drilled three 10m firn cores at elevations between 3450 and 3650 m a.s.l. These cores extended the profile of three firn cores already drilled in January 2006 by AWI at elevations between 2892 m (Kohnen-Station) and 3300 m a.s.l. All cores cover at least 90 years of accumulation. The cores had been analysed with respect to di-electric properties (DEP) as well as stable-isotope content (18O, D).
The paper focuses on the period 1957/58 using the DEP peak coinciding with the eruption of the volcano Agung in 1963 as a clear common time marker. Spatial gradients of accumulation and stable-isotope content (including deuterium excess d) are presented and discussed. The determined linear elevation gradients of 18O content and accumulation rate are -0.97 ‰100m and -2.8 kg/(m2 yr), respectively. The deuterium excess shows no clear trend over the whole investigated elevation range. The stable-isotope values from Dome Fuji values are not lying on the regression line for the values from Amundsenisen. For the time since 1957/58 stable-isotope values indicate stable climatic conditions. There is no clear indication for a uniform trend of local temperature change during the past fifty years.