

ON THE ESTIMATION OF THE PRECIPITATION RATE AT EACH
ALTITUDE BY A NEW ANALYTICAL METHOD
FOR THE METEOROLOGICAL RADAR ECHO (5) (ABSTRACT)

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Using the echo data of vertical pointing meteorological radar and the snow particle size distributions observed on the ground at Syowa Station, Antarctica, the precipitation rate at each altitude was estimated (H. TAKEYA *et al.*; Proc. NIPR Symp. Polar Meteorol. Glaciol., **8**, 169, 1994). But the particle size distribution at each altitude is probably different from that on the ground. We estimated the precipitation rate at each altitude based on an empirically determined distribution model (J. AWAKA *et al.*; J. Radio Res. Lab., **32**, 73, 1985). Since snow particle size distribution depends strongly on the temperatures in this model, the distribution at each altitude is determined by that on the ground and the atmospheric temperature profile measured by radiosonde. At higher altitude, the sizes of snow particles tend to decrease, the back scattering cross sections and reflectivities decrease, and the values of estimated precipitation rate increase. Our preliminary results showed that the differences between the estimated precipitation rates by TAKEYA *et al.* and those in this study become about 20% at altitude 1000 m.

(Received November 10, 1995; Revised manuscript accepted May 17, 1996)