

RASSによる気温観測の実用化

Improvement of Radio Acoustic Sounding System aiming to the operational meteorological instruments

古本 淳一^{1*}, 橋口 浩之¹, 山本 衛¹, 津田 敏隆¹

Jun-ichi Furumoto^{1*}, Hiroyuki Hashiguchi¹, Mamoru Yamamoto¹, Toshitaka Tsuda¹

¹ 京都大学生存圏研究所

¹ Research Institute for Sustainable Humanosphere, Kyoto University

Radio Acoustic Sounding System (RASS) is one of the most promising remote-sensing techniques to measure atmospheric temperature profile by combining a wind profiling radar and acoustic source. RASS has an advantage in the availability in the temperature measurement regardless the weather condition and day-and-night.

The reduction of noise from the ground-based acoustic source is very important subject to make a RASS measurement for practical use. Authors introduced the high-directional speaker system (LRAD-1000) into the RASS measurement of L-band wind profiling radar to reduce the noise pollution problem. LRAD-100 has very low side-lobe emission by combining DSP-controlled acoustics at two center frequencies. This paper demonstrates the performance of noise reduction and temperature measurements by applying LRAD-100 to L-band wind profiling radar.

The vertical resolution of RASS measurement is determined by the pulse-width of wind profiling radar. This paper also aims to improve the vertical resolution of RASS measurement to detect the distinct peak of inversion layers. We propose a new method to use oversampled data to obtain high-resolution temperature profile. The improvement of height resolution can be derived by extracting the information of overwrapped height from the over-sampled data. The results is presented in the paper.

Keywords: RASS, wind profiling radar, atmospheric temperature