

Development of polarimetric 2-D phased array weather radar using minimum mean square error method

KIKUCHI, Hiroshi^{1*} ; WU, Ting¹ ; USHIO, Tomoo¹ ; SHANG, Jin¹ ; KIM, Gwan¹ ; GOTO, Hideto² ; MIZUTANI, Humihiko²

¹Osaka University, ²Toshiba

We have been developing a polarimetric 2-D phased array weather radar which detects small scale phenomena such as tornadoes and downbursts. In this paper, we compare Beam Former method (BF), which is a conventional method in Digital Beam Forming signal processing of array antenna, with Minimum Mean Square Error method (MMSE), which is our proposed method, and discuss simulation results estimated by each method. In BF, antenna pattern is uniform and unique in the radar system, and its sidelobe level is high. As a result, if there are obstacles, for example high building, or very heavy rain area, the observation results of array antenna is imprecision in the region near them. In contrast, we can turn the null-point to interference wave direction at the same time we turn the mainlobe to the desired signal direction in MMSE.

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