

Study of observational accuracy of non-rotating dual-polarization phased array radar

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At present, a phased array radar (PAR) that has high time resolution (30[sec]) and high spatial resolution (100[m]) has been already developed and under operation in Osaka University. PAR has lower accuracy of observation than dual polarization radar because of using only single polarization. Although the development of the dual polarization phased array radar that has both high-speed scanning and high-precision observation is expected, to maintain a high observation accuracy is difficult because of the effect of deterioration of the antenna characteristics by digital beam forming and reduction of cross polarization discrimination which is performance to distinguish between horizontal pattern and vertical pattern. In order to solve such problems and develop dual polarization phased array radar, we designed three types of array (planar, cylindrical, and hemispherical) and simulated.

By comparing the performance of the three types of array, it is found that the hemispherical array is superior to the others because its shape is facing in all directions equally.

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