

Development of the beam forming feed for the parabolic reflector antennas at the Iitate Planetary Radio Telescope (IPRT)

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Iitate Planetary Radio Telescope (IPRT) has been developed at the Iitate village in Fukushima Prefecture, Japan. The main observation wave-length range is meter to decimeter (300-800MHz) and we started test observations at a frequency of 325 MHz. IPRT is a fully steerable offset antenna with a physical aperture area of 1023 square meters, and composed of two separate and same-shaped parabolic rectangle sections. The feed for IPRT is designed with a linear array of crossed dipoles above a ground plane. In order to match a beam pattern of the feed with the rectangular shaped reflector, we developed beam forming technique and applied it to IPRT. The numerical simulation and the laboratory experiment in a radio anechoic chamber showed that the developed beam forming feed system can achieve high aperture efficiency of 70%. We, then, observed some calibration stars and confirmed that the aperture efficiency of IPRT reached 70%.