

[구ID-09] 124-142 GHz Dual-Polarization Superconducting Mixer Receiver for Korean VLBI Network

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We have developed superconducting mixer receivers for 129 GHz VLBI observation in Korean VLBI Network(KVN). The developed mixer has a radial waveguide probe with simple transmission line LC transformer as a tuning circuit to its 5 series-connected junctions, which can have 125-165 GHz as operation RF frequency. For IF signal path a high impedance quarter-wavelength line connects the probe to one end of symmetric RF chokes. DSB receiver noise of the mixer was about 40 K over 4-6 GHz IF band whereas we achieved about uncorrected SSB noise temperature of 70 K and better than 10 dB IRR in 2SB configuration with 8-10 GHz IF band. Insert-type receiver cartridges using the mixers have been assembled for all three KVN stations. On-site performance summary in commissioning phase is presented.

[구ID-10] A Relativistic Magnetohydrodynamic Code for Isothermal Flows

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Building a relativistic magnetohydrodynamic (RMHD) code based on upwind scheme is a challenging project, because eigenvalues and eigenvectors are not yet analytically given. Here, we present analytic expressions for eigenvalues and eigenvectors in isothermal flows. And then we show tests performed with a code based on the total variation diminishing (TVD) scheme.