

V102a Progress in Device Fabrication at Microfabrication Cleanroom in NAOJ

Wenlei Shan, Shohei Ezaki, Akihira Miyachi, Tomonori Tamura, Kazumasa Makise, Takafumi Kojima, Yoshinori Uzawa (NAOJ)

The microfabrication cleanroom in Advanced Technology Center of NAOJ is a dedicated facility for superconducting devices that support ALMA-J project and other radio telescopes operated by NAOJ and universities. In the recent one year we have been making progress in the following technological aspects. (1) The fabrication of high-current density SIS junctions based on AlN-barrier technology has improved in term of reproducibility. High- J_c junctions are being used in various ongoing projects in the astronomical society, aiming to achieve broadband frequency response; (2) MMICs for sideband separation (2SB) dual-polarization SIS mixer were fabricated for the first time. These MMICs will be used in the development of multibeam SIS receiver technology. (3) Silicon micro-machining was successfully applied in the fabrication of anti-reflection layers for terahertz applications. This work marks the second outcome of our silicon micro-machining technology after the planar OMTs that are integrated in MMICs.