

Development of THz Superconducting Mixers and Detectors for DATE5

Sheng-Cai Shi^{1,2,*}, Jing Li^{1,2}, Wen Zhang^{1,2}, Wei Miao^{1,2}, Zhen-Hui Lin^{1,2,3}, Jin-Ping Yang^{1,2}, Dong Liu^{1,2},
Wen-Ying Duan^{1,2}, Zheng Wang^{1,2}, Zheng Lou^{1,2}, Qing Shi^{1,2,4}, Zhi Li^{1,2,4}, Kang-Ming Zhou^{1,2}, Ming
Yao^{1,2,3}, Jie Hu^{1,2,3}, Yun Ren^{1,2}, and Qi-Jun Yao^{1,2}

¹*Purple Mountain Observatory, Chinese Academy of Sciences, Nanjing, China*

²*Key Laboratory of Radio Astronomy, Chinese Academy of Sciences, Nanjing, China*

³*University of Chinese Academy of Sciences, Beijing 100049, China*

⁴*University of Science and Technology of China, Hefei 230026, China*

*Contact: scshi@pmo.ac.cn

Abstract—The terahertz (THz) and FIR band is a frequency regime to be fully explored in astronomy. However, water vapor renders the terrestrial atmosphere opaque to this band over nearly all of the Earth's surface. Dome A in Antarctic – the site for China's Antarctic Observatory, with an altitude of 4093 m and temperature below -80 Celsius degree in winter, offers the best possible access for ground-based astronomical observations in the THz and FIR band. China is planning to build a 5-m terahertz telescope (DATE5) there. We will briefly introduce the site survey results by an unmanned Fourier transform spectrometer (FTS) and the DATE5 telescope, and then present the latest development of superconducting SIS and HEB mixers for 0.85 THz and 1.4 THz, respectively, and large-format TES and MKIDs detectors for a superconducting imaging camera named TeSIA.