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Design and performance of a cryogenic scanning tunneling microscope in high magnetic field for 2D layered materials study[1] TIEN-MING CHUANG, PEI-FANG CHUNG, SYU-YOU GUAN, SHAN-AN YU, CHE-AN LIU, CHIA-SHENG HSU, CHIH-CHUAN SU, Institute of Physics, Academia Sinica, Nankang, Taipei 11529, Taiwan, RAMAN SANKAR, FANG-CHENG CHOU, Center for Condensed Matter Sciences, National Taiwan University, Taipei 10617, Taiwan — We will describe the design and performance of a cryogenic scanning tunneling microscope (STM) system in a high magnetic field. A Pan-type STM is mounted on a homemade low vibration 4He pot refrigerator, which can be operated in continuous flow mode at T $\sim$ 1.6K and in a magnetic field of up to 9 Tesla. A cleavage device at T=4.2K stage is used to cleave the 2D layered materials before inserting into STM as well as functioning as the radiation shield. The liquid helium boil rate of 4.6 liters per day is achieved due to our careful design, which allows the measurement at base temperature up to 10 days. We will demonstrate its capability of measuring atomically registered energy resolved spectroscopic maps in both real space and momentum space by our recent results on Rashba BiTeI.

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Tien-Ming Chuang
Institute of Physics, Academia Sinica, Nankang, Taipei 11529, Taiwan

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