MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Specialised Technologies, Including Nanotechnology (8)

Author: Dr. chaoyang zhou
Lanzhou Institute of Physics, China, 13893458746@139.com

Dr. Shengsheng Yang
Lanzhou Institute of Physics, China, yangss510@hotmail.com
Mr. yuxiong xue
Lanzhou Institute of Physics, China, cheng20050322@163.com

AN ACCURATE LOW CURRENT MEASUREMENT CIRCUIT FOR EXTREMELY HIGH VACUUM IONIZATION GAUGE

Abstract

Carbon nanotube field emission cathodes are being used in extremely high vacuum ionization gauge at Lanzhou Institute of Physics, and an accurate low current measurement circuit has been developed to measure the ion current at pA range. The circuit consisted of a picoammeter with a bandwidth of 1 kHz. A low input bias current precision amplifier LMP7721 and new guarding and shielding techniques were used in the picoammeter circuit which was allowed to measure current less than 1 pA with a current gain of 0.11 V/pA and noise less than 10 fA. The dependences of the sensitivity factor of the gauge on electrical parameters at extremely low pressure can be researched with the use of this circuit.