Contribution ID: **1** Type: **Talk**

Design of Extremely Low Noise Amplifier with GaAs HEMTs for SKA Band 2 Receiver

Cryogenic low noise amplifiers (LNAs) are in high demand for highly sensitive detection in radio astronomy and quantum technology research and development. This presentation describes the design and testing of an extremely low noise amplifier based on 3-stage GaAs HEMTs and a microwave integrated circuit. Utilizing computer-aided design techniques, lumped passive components were adapted to integrate with GaAs low noise transistors to optimize the noise and return losses. This LNA design achieved an extremely low noise temperature of 1.0 K, larger than 40 dB gain, and low input and output return losses < -10 dB, in a wide bandwidth from 900 MHz to 2000 MHz at a physical temperature of 15 K. It realized high gain and an excellent gain stability of 0.03% RMS simultaneously, and meets the stringent requirements of the Square Kilometer Array receivers.

Suggested duration

15

Primary author: Dr JIANG, Nianhua (National Research Council of Canada)

Co-author: Dr KNEE, Lewis (National Research Council of Canada)

Presenter: Dr JIANG, Nianhua (National Research Council of Canada)

Session Classification: Instrumentation Programme

Track Classification: Instrumentation