WP5 JRA AETHRA

AETHRA (Advanced European Technologies for Heterodyne Receivers for Astronomy) aims at exploiting new technologies, such as highly integrated microelectronic semi- or superconducting circuits, to significantly improve the next generation receivers of mm and sub-mm wavelength telescopes, reinforcing European technological and scientific leadership by considerably improving the receiver performance and observing speed of the European-owned world- leading facilities ALMA, APEX, NOEMA and PV. The most effective means to boost the observing speed of those instruments at a reasonable cost consist of: a) widening the Intermediate/Radio frequency (IR/FR) receiver bandwidths and b) implementing large focal plane arrays (FPAs) of heterodyne receivers. (WP5 Description).

The AETHRA parter: MPG, IRAM, INAF, OSO, STFC, SRON, OBSPARIS, UOXF, UAH, ESO, Fraunhofer, RUG, UCO, TUD

The AETHRA tasks:

- WP5.1: Semiconductor LNAs and MMIC receivers [MPG, IRAM, INAF, Fraunhofer]
- WP5.2: Very large Focal Plan Array of SIS mixer receivers [IRAM, OSO, UOXF, UAH]
- WP5.3: FPA of receivers operating around 1 THz [UOXF, SRON, OBSPARIS, RUG, UAH, UCO, TUD]
- WP5.4: Subtasks common to Tasks 5.1-5.3 [IRAM, OSO, STFC, OBSPARIS, UOXF, UAH, RUG, UCO, TUD]

This activity is lead by IRAM - Leader C. Kramer

AETHRA Meetings / Teleconferences

- 11-12 April 2017, Grenoble/FR - AETHRA Kick off
- 7 June 2018, Grenoble/FR + videoconference AETHRA Progress Meeting
- 25 September 2019, Grenobel/FR AETHRA Progress Meeting

AETHRA publications:

QMix: A Python package for simulating the quasiparticle tunneling currents in SIS junctions, John D. Garrett (University of Oxford) and Ghassan Yassin (University of Oxford), published 20 March 2019

Deliverables

The following deliverables are scheduled for WP5:

No	Del. Title	Lead beneficairy	Type	Dissemination level	Due date	Submission date	Document
D5.7	Multipixel demonstrator of FPA of HEB mixer receivers	OBSPARIS	Demons	Public	31.12.2019		
D5.6	Multipixel FPA demonstrator composed of 2SB SIS mixer receivers operating around 1THz	RUG	Demons	Public	31.12.2019		
D5.5	Multipixel FPA demonstrator composed of miniaturized 2SB receivers operating near 1 mm	IRAM	Demons	Public	31.12.2019		
D5.4	Very wideband RF/IF SIS receiver Designs and test report on prototype wideband mixer built on 2SB technology and operation around 1-mm	OSO	RE	Public	31.12.2019		
D5.3	Multipixel W-band FPA demonstrator composed of cryogenic module and down conversion module	IRAM	Demons	Public	31.12.2019		
D5.2	Low noise, cryogenic 35 nm mHEMT MMIC amplifiers	Fraunhofer	Demons	Confidential	31.12.2019		
D5.1	SIS junction mixer operating around 1 THz	UOXF	RE	Public	30.6.2019		