MASTER'S THESIS INTERNSHIP OFFER

DESCRIPTION

› Title : Demonstrate the feasibility and the design of a novel architecture of 360° active phase shifter for beamforming in 5G using injection looked oscillator approach with quadrature VCOs.

› Hosting organization: University of Poitiers (IUT Angoulême)

› Lab: XLIM Angouleme

› Research Team: SYCOMOR/CCSNL

› Scientific pole: SRI/SRF

› Starting date (month/date): 1er mars 2023

› Description of the internship offer:

5G technology promises to deliver more new services in many areas such as: autonomous driving, smart cities, smart farming, ...

To support increased traffic capacity and enable the transmission bandwidths needed to support very high data rates, 5G will be using millimeter waves for transmission which offer a vast amount of spectrum for mobile communication systems. Nevertheless, using millimeter waves is still a challenge including system complexity to be able to control the massive traffic and higher cost.

The transmission of the signals with minimum losses and interference is going to be one of the most important factors of 5G deployment. For this, some techniques such as beamforming will be used to improve the transmission of data; however, performing it at millimeter wave frequencies will be a big challenge.

The main goal of this internship project is to demonstrate the feasibility of designing a novel architecture of a RF circuit, based on active phase shifter, for 360° continuous beamforming in 5G. The structure will be based on injection looked oscillator approach using quadrature VCOs, and integrated into a 0.13 μm BiCMOS SiGe:C technology using Cadence environment.

The supervision will be ensured by Abdelaziz HAMDOUN (MCF) and David CORDEAU (MCH, HDR) both at university of Poitiers (IUT Angoulême). Aware of the subject matter, the internship has a natural continuation as a PhD Thesis. So, this can constitute a very good preliminary.

Objectives (up to 5 sentences):

The proposed specifics objectives are: -State of the art of quadrature's VCOs. -Design and simulation of a quadrature VCO associated to injection looked oscillator, -Design and simulation of a multiplexer architecture working at millimeter waves frequencies, -Simulation of the whole design on Cadence.

SKILLS

Expected skills of the applicant:

Curiosity, reliability, diligence, strong skills in active circuits

PHD THESIS OPPORTUNITIES

PhD thesis opportunity after the Master course:

☒ Yes   ☐ No

If yes, financing already obtained:
☒ Yes   ☐ No

If yes, what kind of funds: PEPR 5G

CONTACT & APPLICATION

Surname and first name of the internship supervisor(s):
HAMDOUN Abdelaziz
CORDEAU David
Email of the supervisor(s): abdelaziz.hamdoun@xlim.fr; david.cordceau@xlim.fr

Phone number of the supervisor(s): 05 45 67 32 28

The application shall be sent to the email: abdelaziz.hamdoun@xlim.fr;
david.cordceau@xlim.fr

Closing date for applications: Cliquez ou appuyez ici pour entrer une date.