Minutes from OPEN INNOVATION WP 4 technical meeting

31-10-2016 14.00 to 15.00

Attendance: Longfei, Weiming, Roel, Rui, Luc

Opening:

This is the first work package meeting, aiming to deal with the planning and task definitions for the WP 4 (Process improvement) of the Open Innovation project.

The following meetings are planned every two weeks on Monday afternoon 14.00-15.00 at Flux 9.098, TU/e.

Task 1 & 3: Material and process for high-speed modulators and associated electrodes

Responsible: Longfei

- Due to the very tight bond between these two tasks, they will be dealt with in one category from now on.
- A new plan is proposed for conducting this task with following comments:

Phase	Task 4.1	Task 4.3
Year 1	Effect Epi	CPW electrode + RF line
	Smart growth	Metal plating
Year 2	Improved Epi	CL-electrode + RF line
	Better controlled layer thickness and index; Butt-joint optimization	Planarization thickening with vias/slopes
Year 3	Innovative Epi	Improved electrode + RF line
	Al-MQW or N-I-N junction; Localized Zn diffusion	Planarization uniformity control (e.g. with CMP)

  - The tasks in phase 1 are generally ready to go into test runs, given the fact that Effect Epi can be used in this project.
  - Smart will do the epitaxy growth (by Peter and Steven), and suggest TU/e technician to focus only on associated processing (regrowth butt-joint, Al etching, reliability, etc) rather than growth using a different reactor. **[Action Longfei]** will discuss this in the next JTC management meeting.
  - Epi control (thickness, strain, index, etc) will be monitored and improved jointly with WP 2 (Pilot line production).
  - Localized Zn diffusion in Epi will reduce both optical and RF loss but may have large impact on active regions. It is not foreseen to be used in MPW within this project, but trials will be valuable in parallel test runs.
  - Metal plating (>2 µm) can be done in Smart run. Patterning tolerance (mainly in lateral resolution) has to be considered and tested.

    - BCB is a better choice than polyimide to planarize structures. However, the thickness uniformity over the chip is worse.
    - Challenge for thicker planarization is the opening of the top of the mesa with sufficient precision. Stepper is an option for the future. An alternative scheme is: polyimide planarization -> etch back -> contact pads -> BCB planarization -> open to contact pads -> metal plating. The last 3 steps are new.

Task 2: DUV lithography

Responsible: Roel

- **[Action Roel]** will make a plan for this task. The process parameter matrix will be helpful as a guideline for the requirements in this task.
- **[Action Roel]** and Longfei should figure out how Lionix will get involved in and contribute to this task.

Overall:

- A process parameter matrix initiated by Longfei is spreading in the partners of this task. **[Action Longfei]** will get more inputs for the requirements from design partners (WP 3) and for the status from pilot line (WP 2).
- A detailed technical plan should be made before 21-11-2016 (OPZ officer meeting). **[Action Longfei]** will make a first version and sent it around before the end of this week.
- Next meeting will be cancelled due to Longfei's holiday. However, **actions are requested by the end of this week**, followed by discussions via emails or meetings next week.
- Next meeting: 28-11-2016, 14.00 to 15.00, Flux 9.098, TU/e