

Project Meeting Karlsruhe April 26th, 2013



KIT Technical Presentation

Argishti Melikyan, Sascha Muehlbrandt,
Martin Sommer, Manfred Kohl, Juerg Leuthold

Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany



Nano Scale Disruptive Silicon-Plasmonic Platform for Chip-to-Chip Interconnection

Milestones (KIT)



MS26	Fabrication of plasmonic waveguide couplers with less than 3 dB coupling loss	5	KIT	12	10/2012		
MS27	Design of first generation beam shapers and compact optical filters	5	IMEC	12	10/2012		
MS28	DDCM with electrical PHY design and verification	5	ST	12	10/2012		
MS37	Plasmonic active device characterization results	6	KIT	12	10/2012		
MS11	Fabrication of plasmonic modulator on a SOI platform	3	KIT	15	01/2013		
MS18	Demonstration of conductive QD layers with photoconductive properties	4	UVEG	15	01/2013		
MS19	Demonstration of metal-(lithographic) polymer and QD metal-(lithographic) polymer nanocompo-sites	4	UVEG	15	01/2013		
MS29	Data codecs for power consumption reduction	5	ST	15	01/2013		
MS30	Decision on plasmonic waveguide couplers with less than 3 dB coupling loss	5	KIT	15	01/2013		

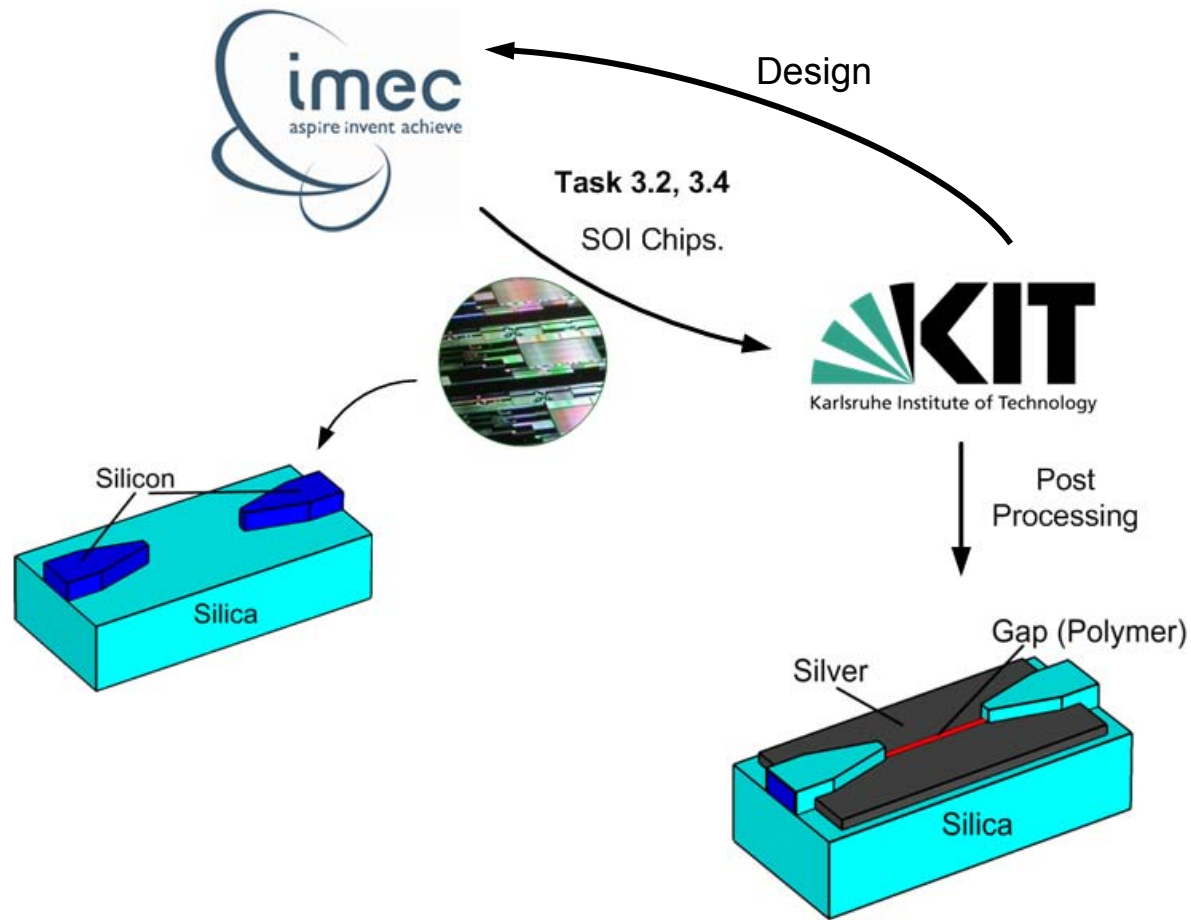
Task 3.4 Fabrication of Si-plasmonic modulators

Task 5.1 Modelling and fabrication of coupling Si waveguide to plasmonic waveguide

Task 6.1 Characterisation of active and passive plasmonic devices



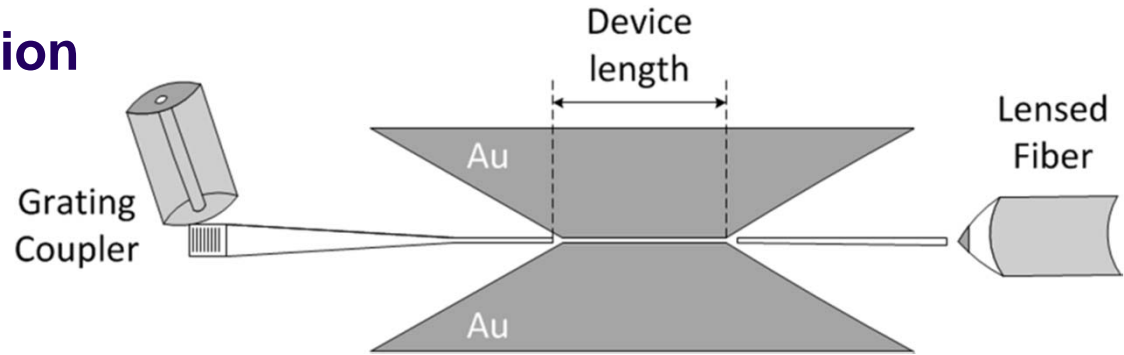
Task 5.1 Plasmonic Coupler & Modulator



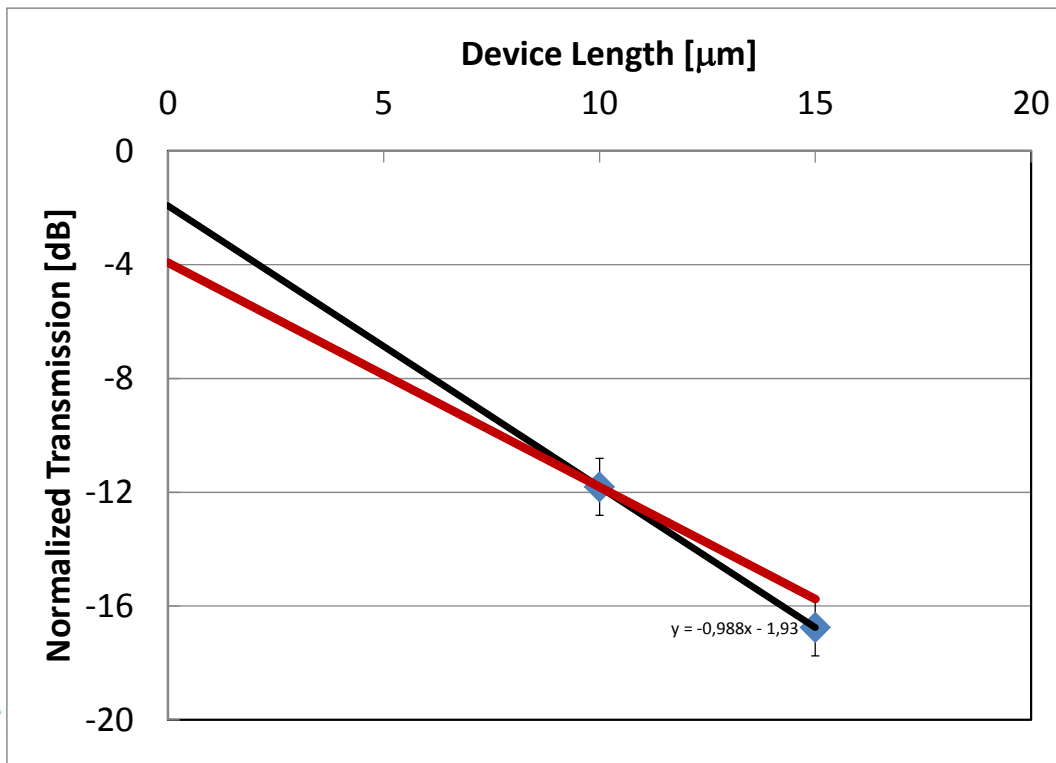
Task 5.1 Modeling and Fabrication of SPP Couplers



Light Coupling Configuration



Cut-back measurement

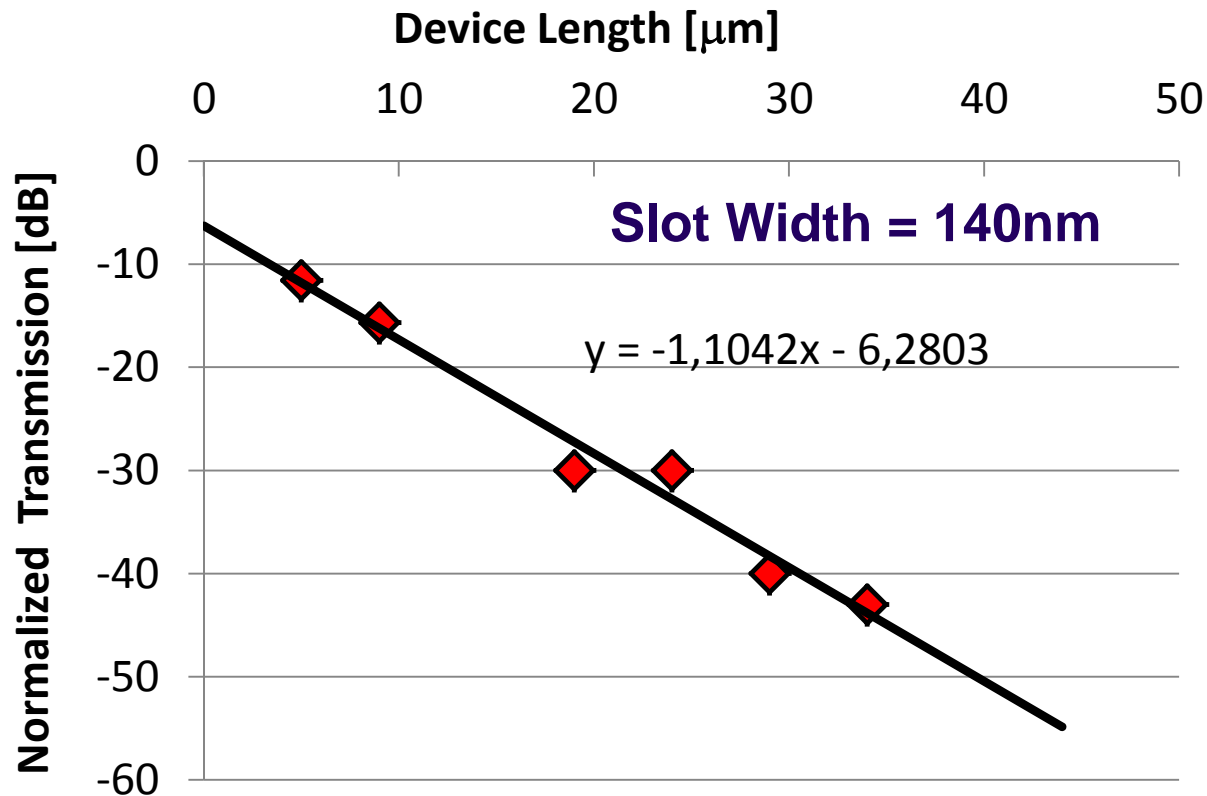


2dB coupling loss per tapered coupler!

From Gent Meeting!



Task 5.1 Modeling and Fabrication of SPP Couplers



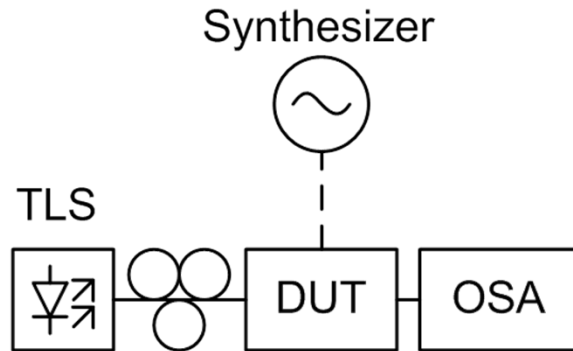
Coupling loss is ~3dB per metal taper!



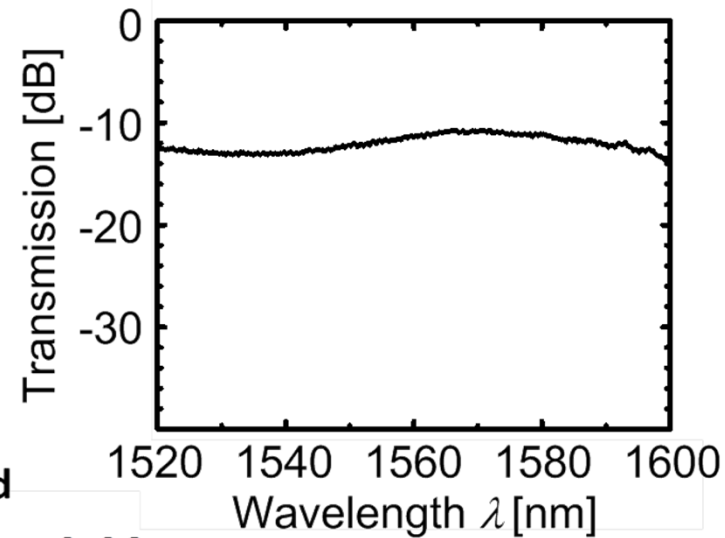
Task 6.1 Characterisation of active and passive plasmonic devices



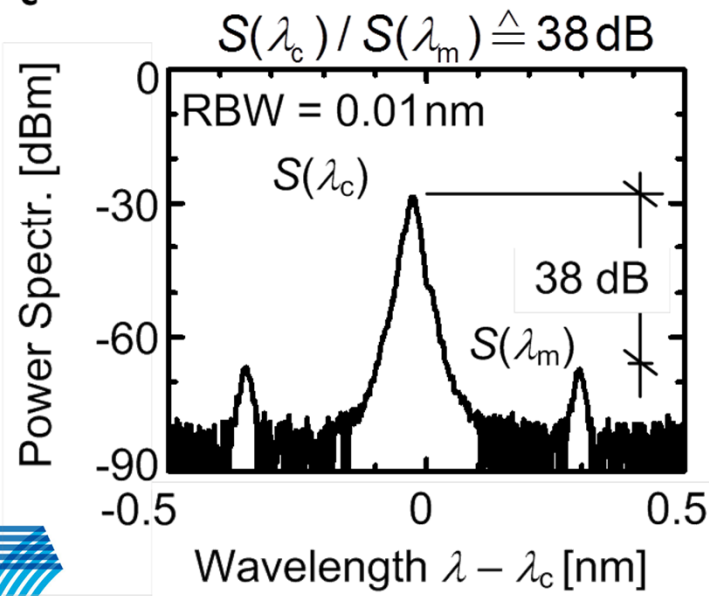
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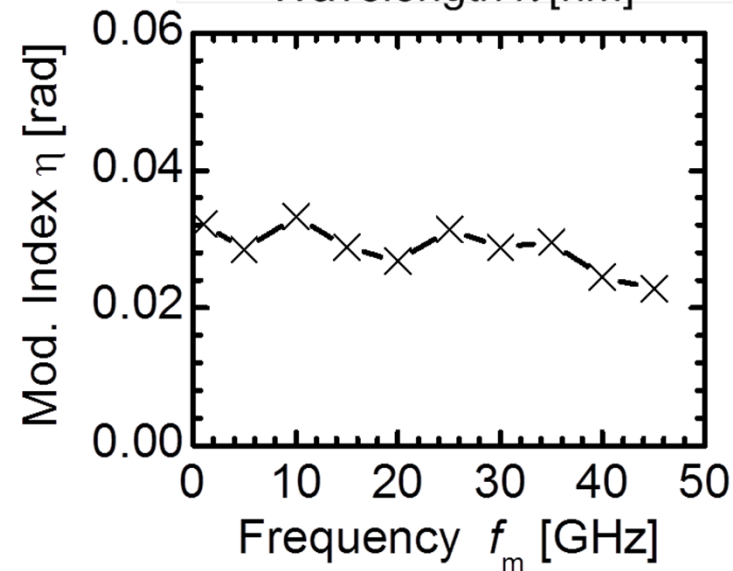
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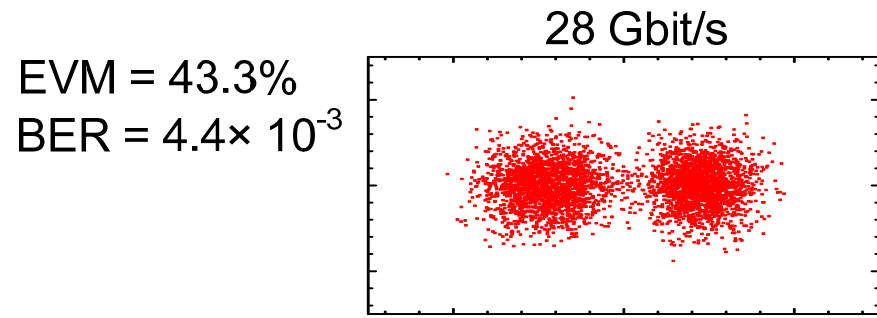
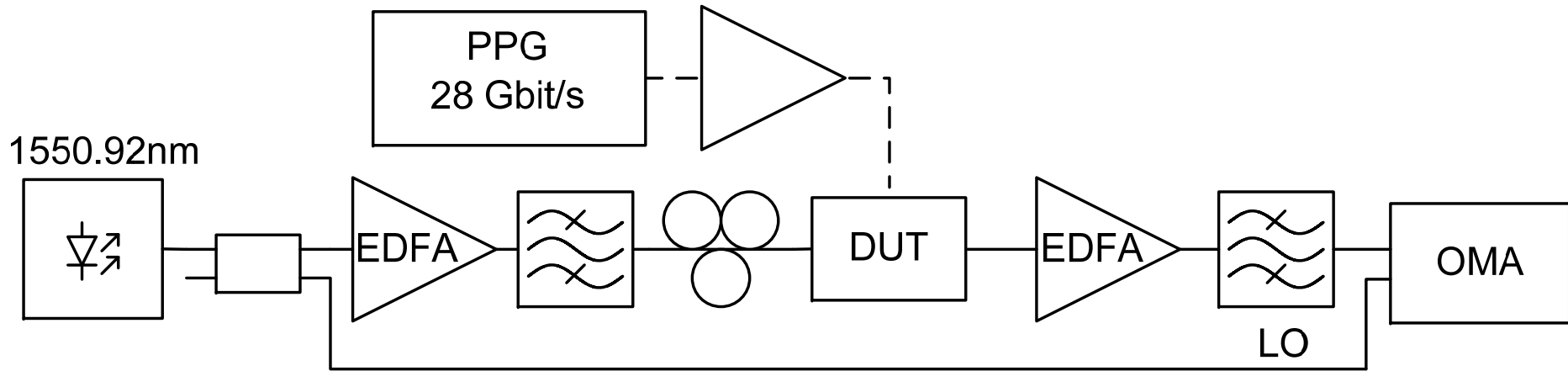
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Task 6.1 Characterisation of active and passive plasmonic devices



Advantages

- Quadrature Amplitude Modulation (QAM) Applications
- Increased bitrate

Disadvantages

- High losses → sensitivity of the photodetectors, laser power
- Coherent receiver necessary for QAM → Clock?
- Difficult to fabricate

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