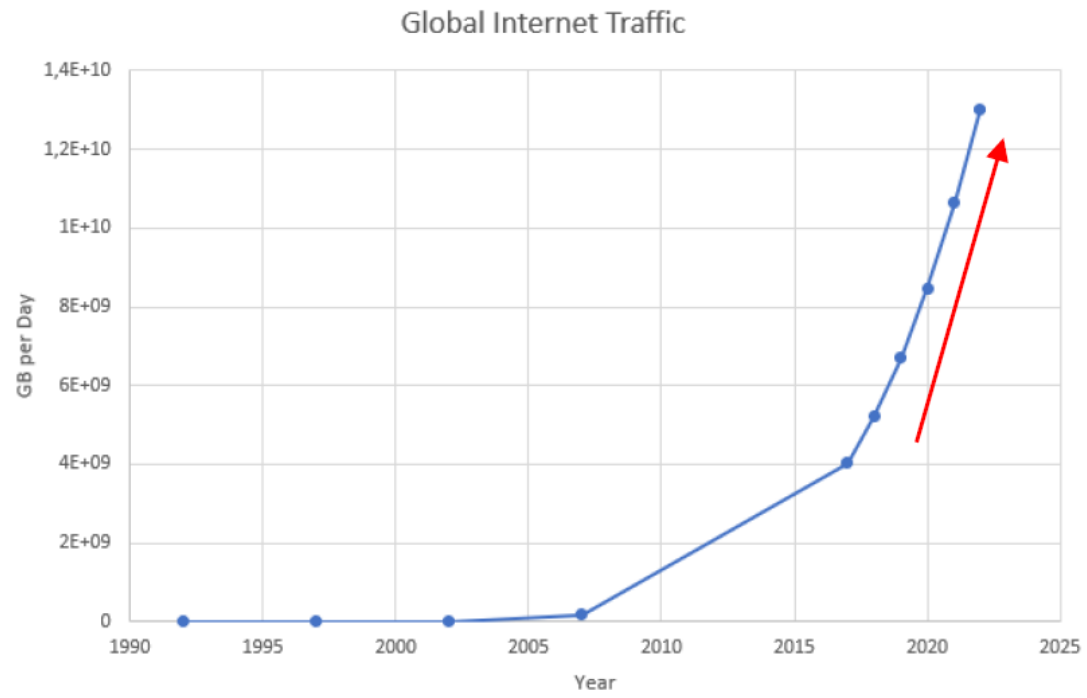
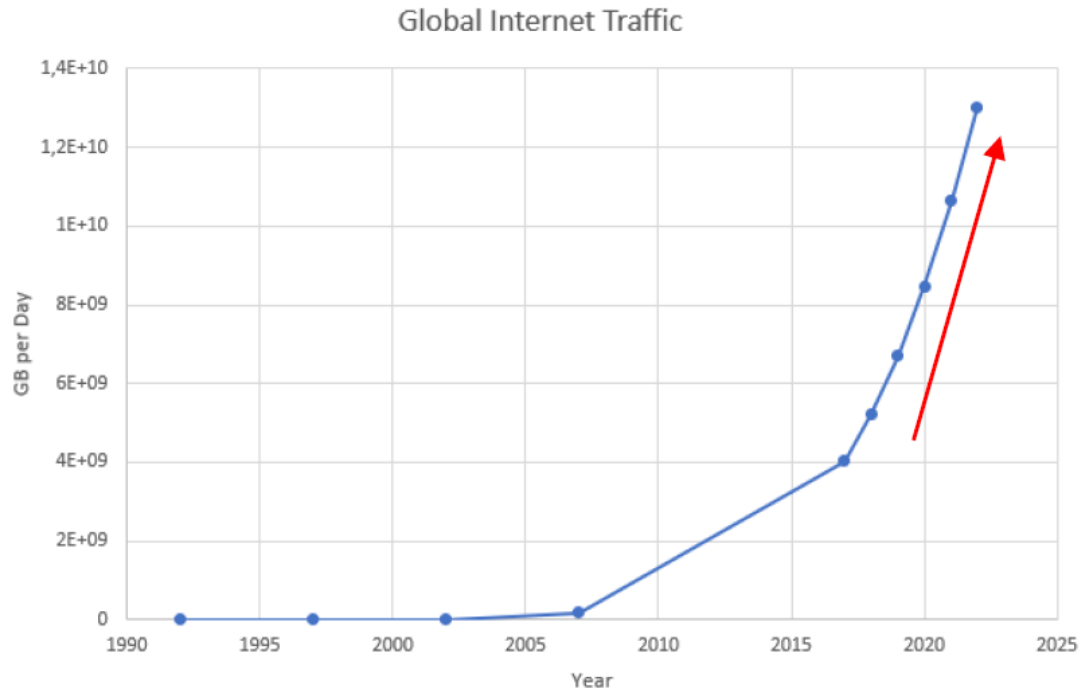


## MODELLING OF HIGH SPEED VCSELS

# WHY HIGH SPEED VCSELS ?



# WHY HIGH SPEED VCSELS ?



**Hyperscale Data Centers >1.500.000 sq-foot:**

75% of traffic is today within the Datacenters:

**10 000x <3m – copper links**

**1 000x 1-300m – VCSEL-based AOCs**

**1 000x 100-400m**

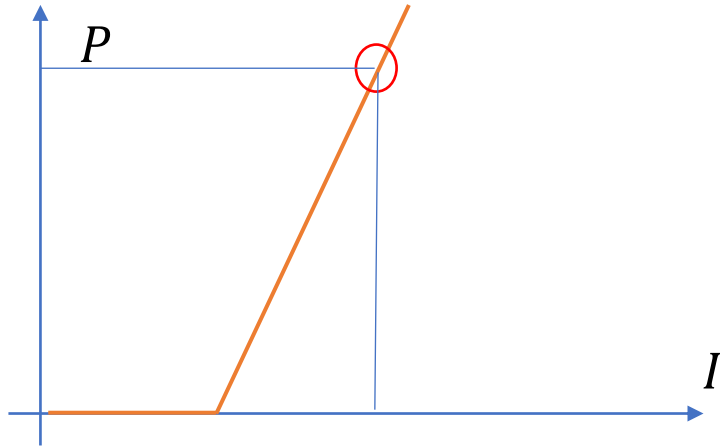
**100x 100-1000m**



Optical cable

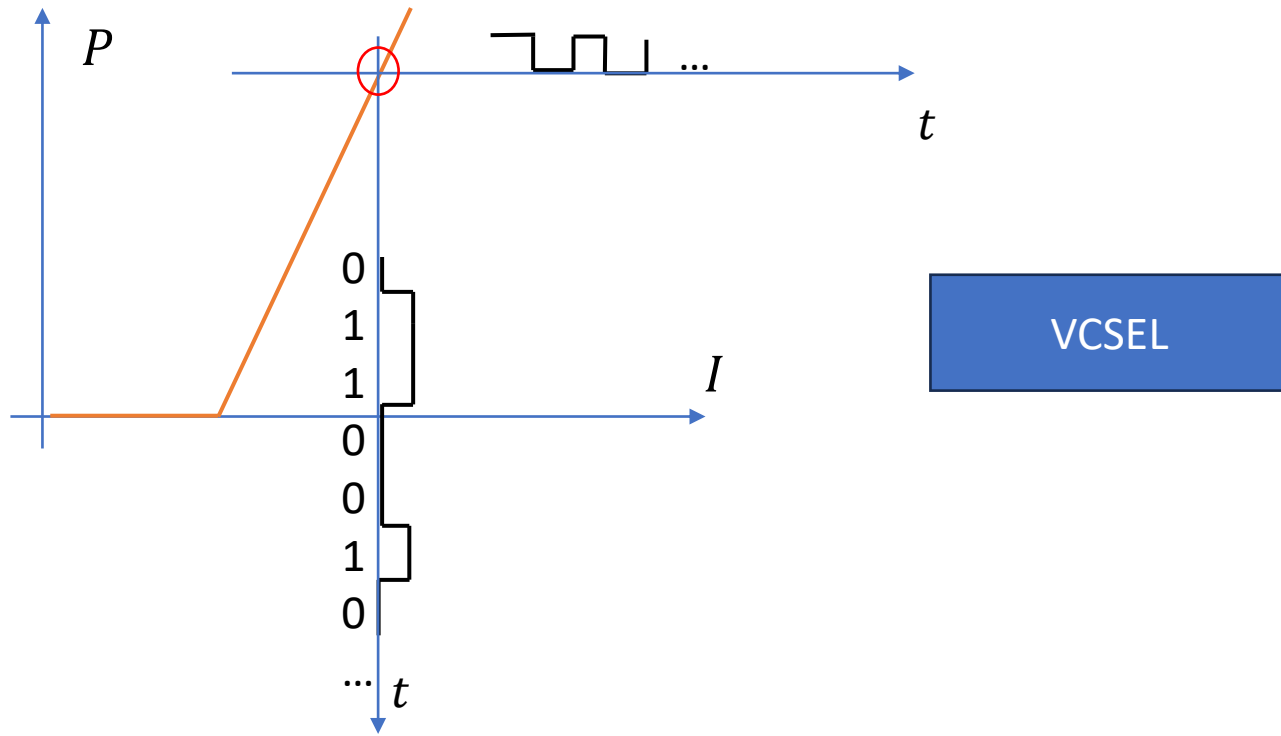
# WHY HIGH SPEED VCSELS ?

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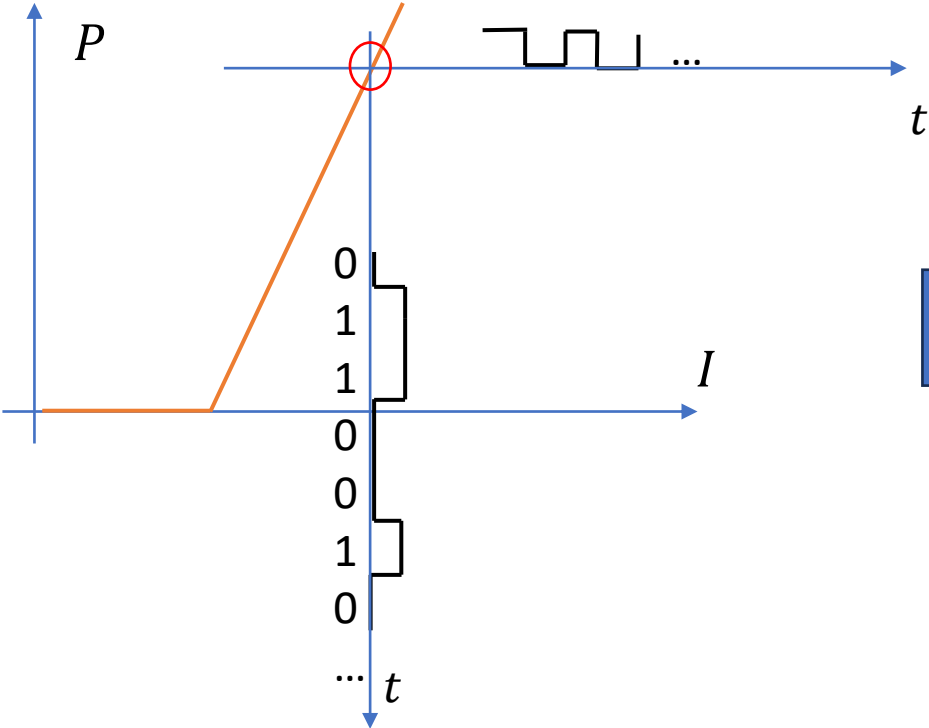


VCSEL

# WHY HIGH SPEED VCSELS ?



# WHY HIGH SPEED VCSELS ?

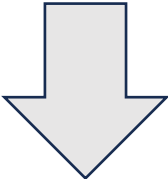


VCSEL

OPTICAL FIBER

RECEIVER

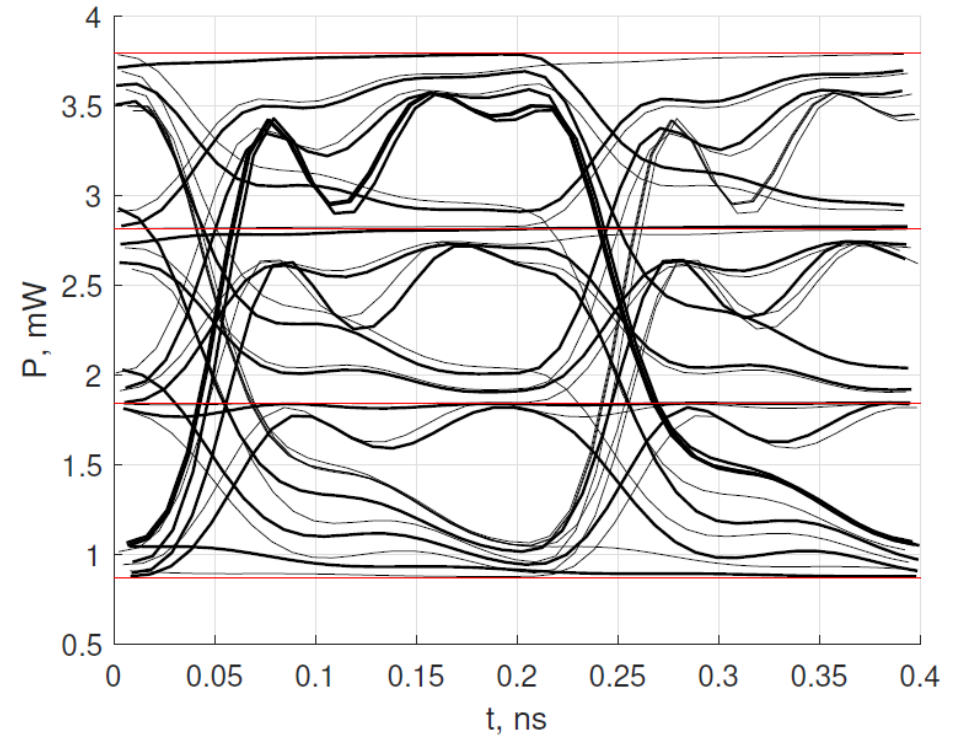
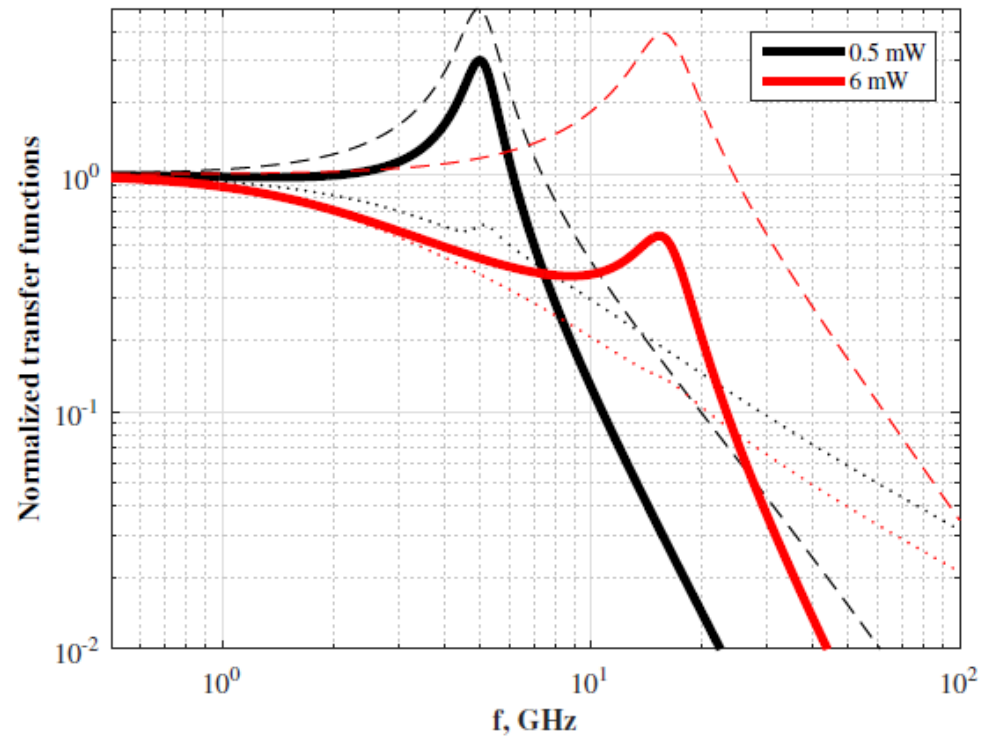
SHORT HAUL OPTICAL LINK SCHEME



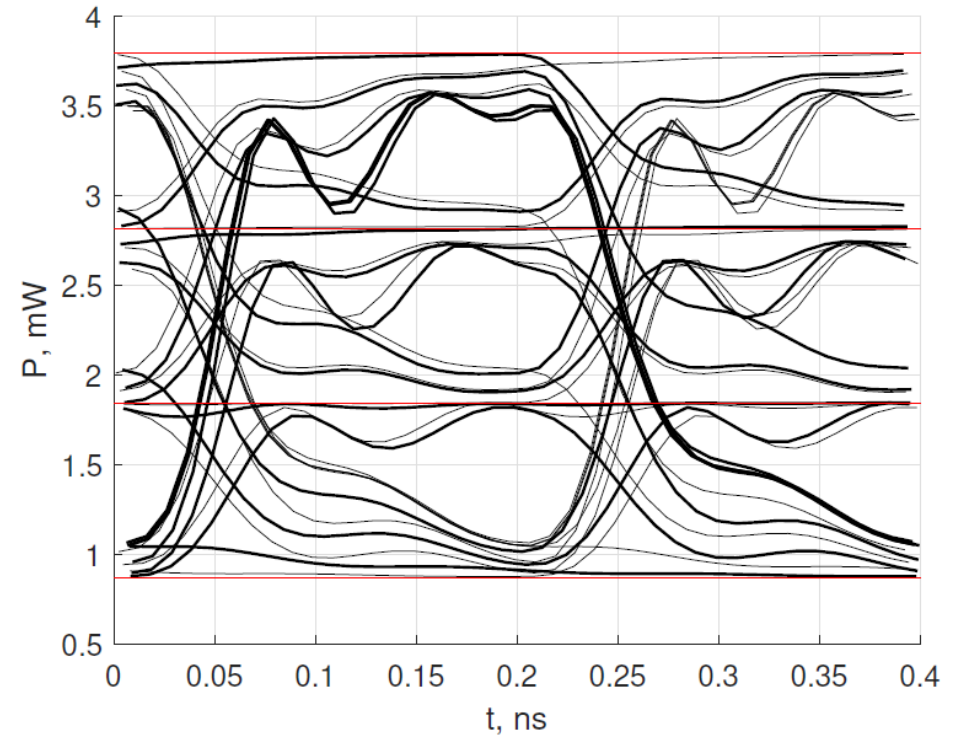
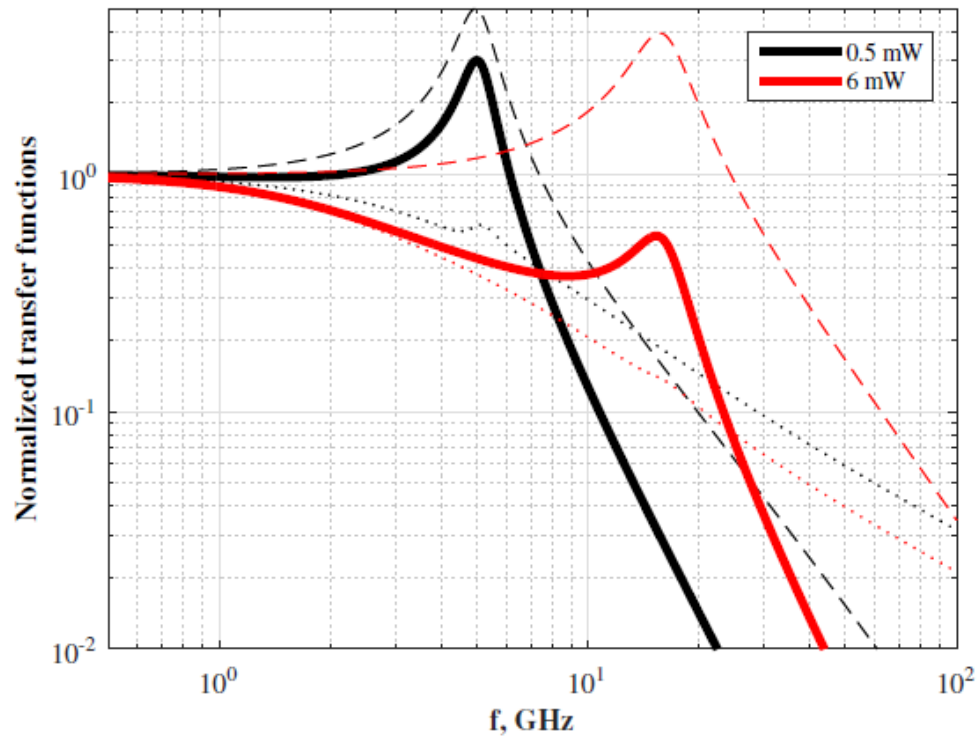
NEED FOR FAST VCSELS DESIGNS

## DYNAMIC MODELLING (II)

OUR MULTIPHYSICS SOLVER CAN STUDY THE DYNAMICS OF A (STANDARD) VCSEL :

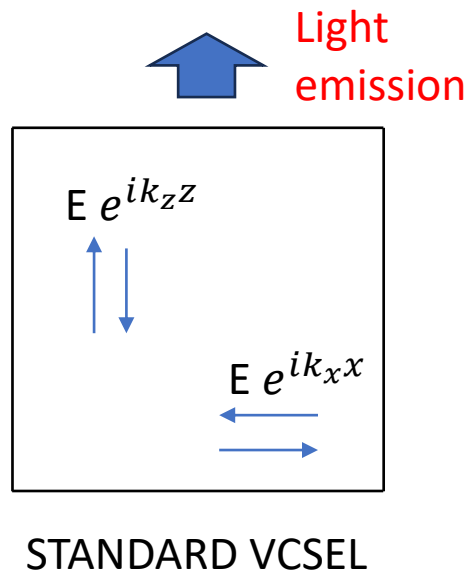


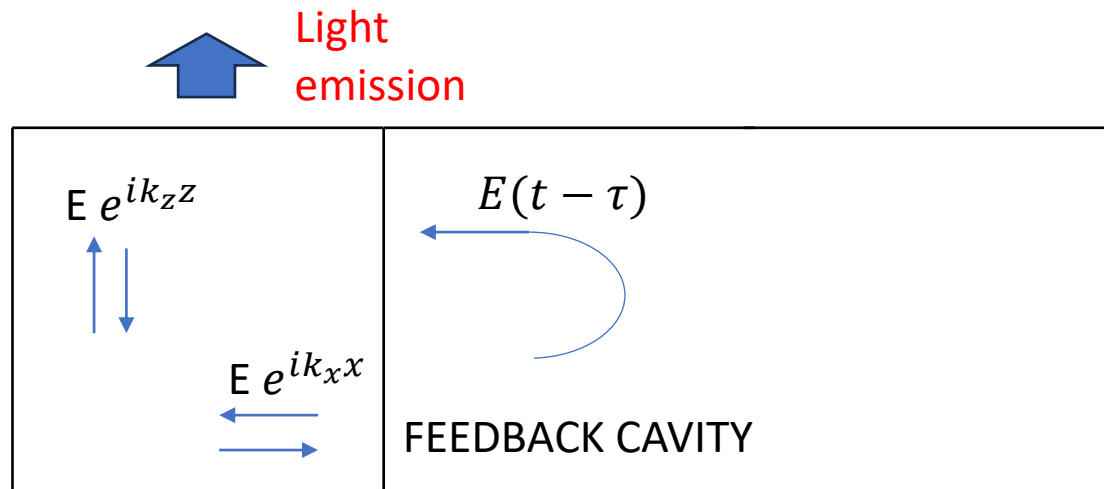
OUR MULTIPHYSICS SOLVER CAN STUDY THE DYNAMICS OF A (STANDARD) VCSEL :



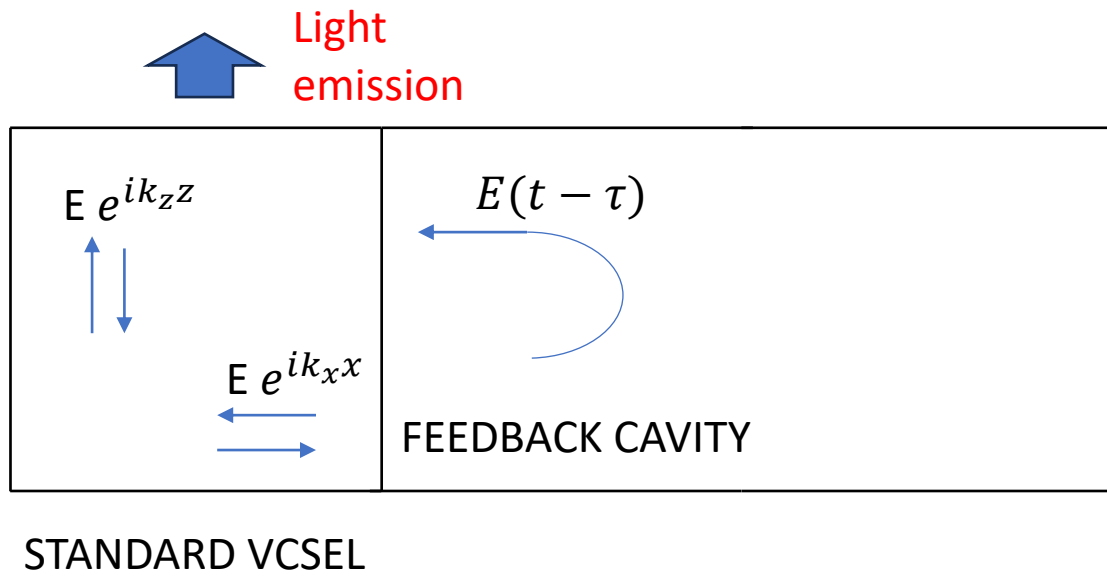
THE STANDARD VCSEL DESIGN HAS  
REACHED A BANDWIDTH LIMIT!



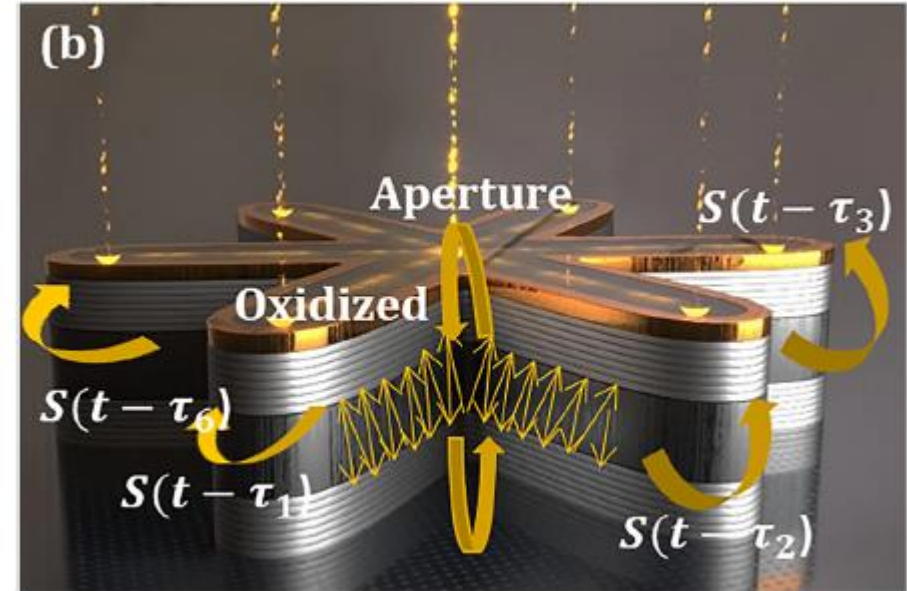




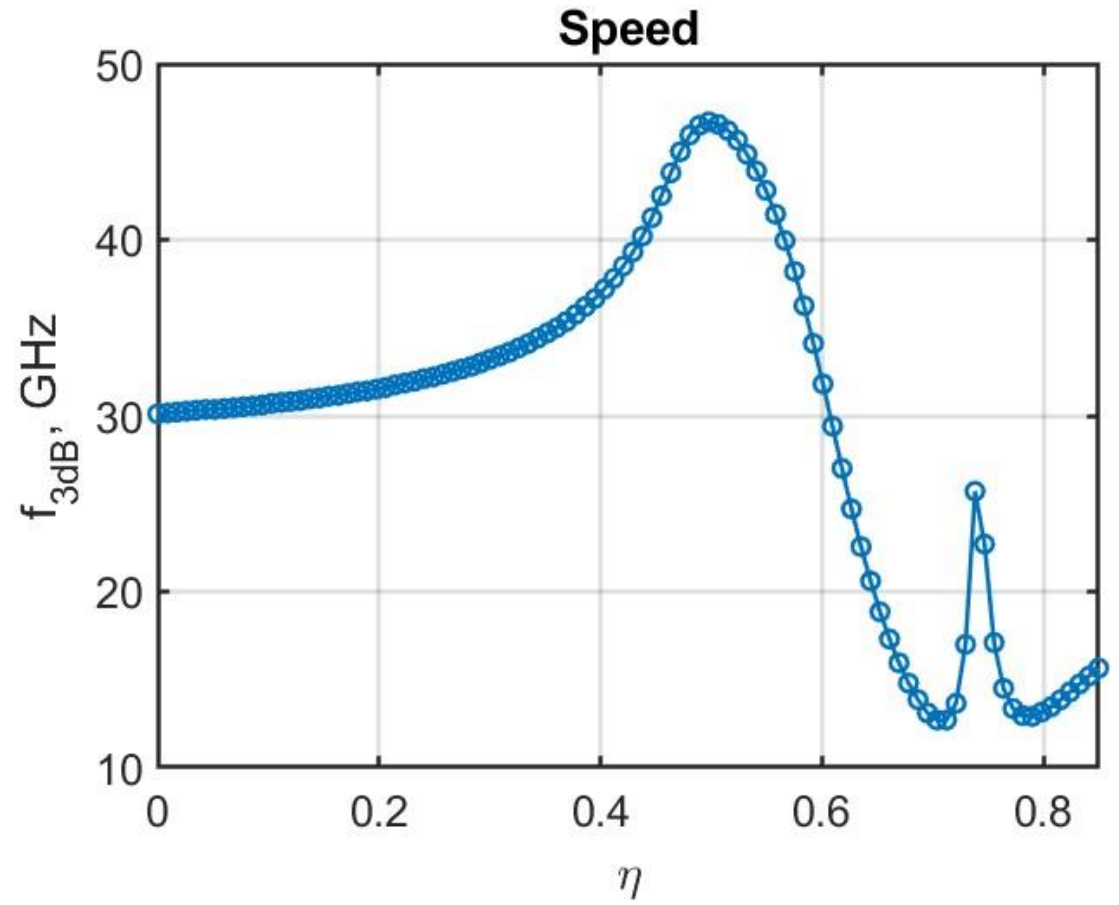
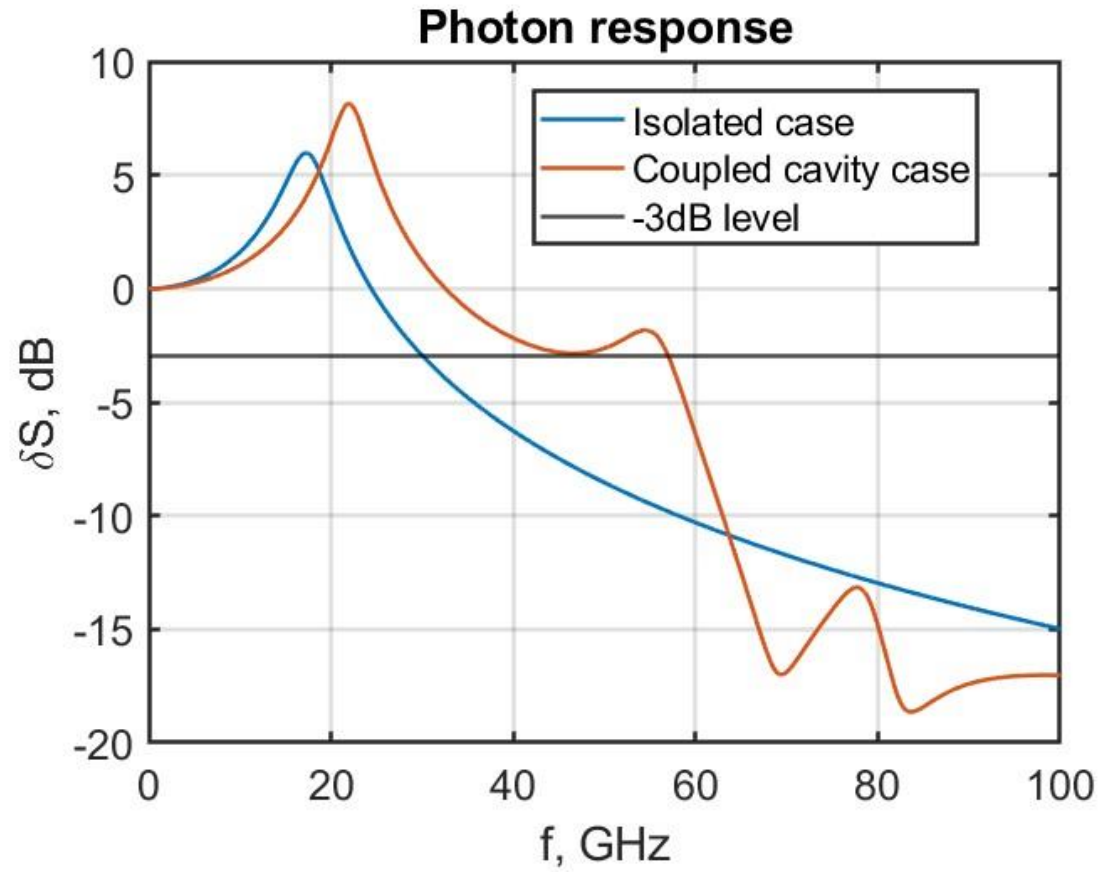
STANDARD VCSEL



[1]

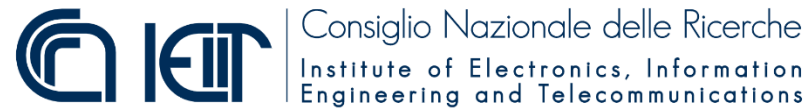


# COUPLED CAVITIES FOR HIGH SPEED VCSELS



PRELIMINARY RESULTS BY LUMPED MODELS.

THANK YOU FOR THE ATTENTION!



Martino D'Alessandro