RD 50 Common Project

Note that the methods developed are rather generic, applicable to a wide variety of the Si devices.

The initial trials started within the framework of ATLAS Planar Pixel Collaboration.

Last summer, the scribe-and-cleave technology of fabricating slim edge sensors has also been approved as RD50 project.

The participating institutions are interested in both p- and n-type sensors.

RD50 funding request

- Date: *05-26-2011 (Distributed version)*

Title of project: Development of "slim edges" using cleaving and ALD processing methods

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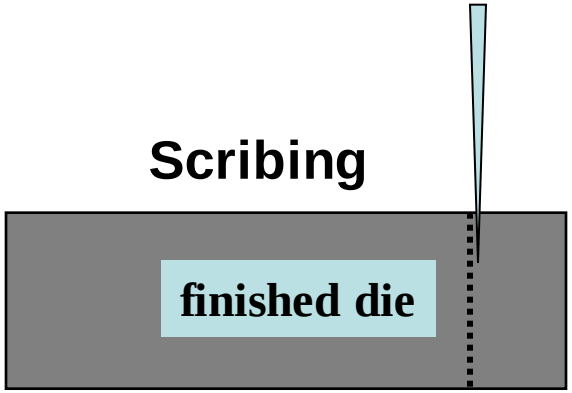
Outside Institutes:

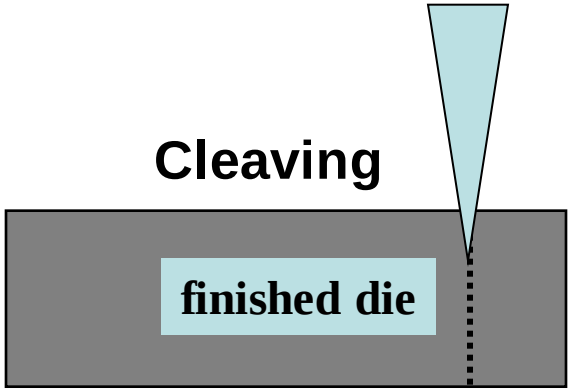
1. *US Naval Research Laboratory, Bernard Phlips*
2. *FBK Trento, M. Boscardin*

Evolution of Slim Edge Treatment



Laser

XeF2 Etch



Tweezers

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Native Oxide
+ Radiation

N-type

P-type

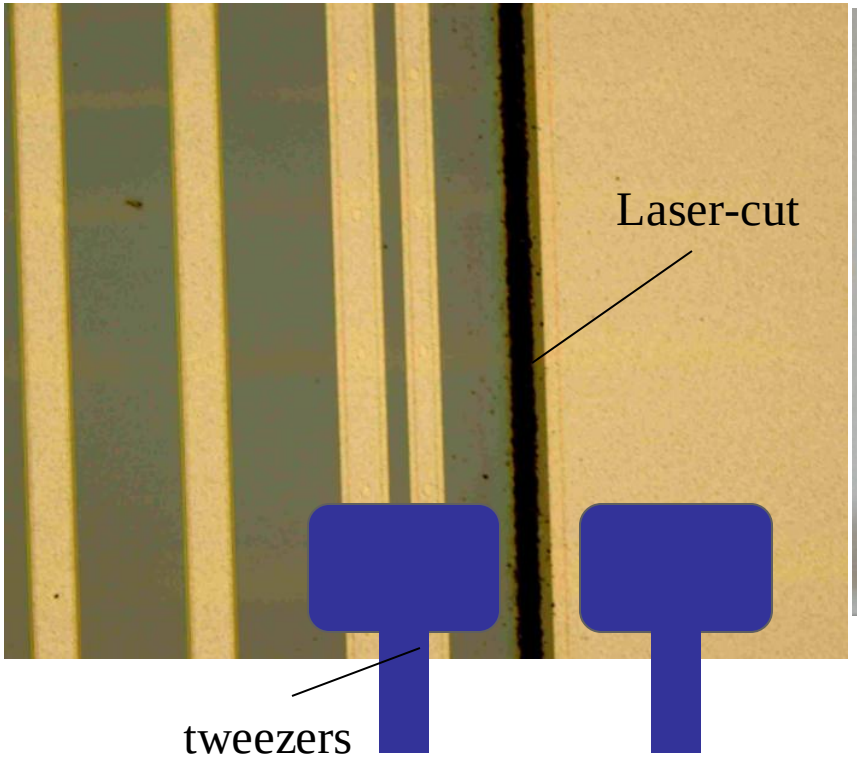
PECVD
Oxygen

ALD
Alumina

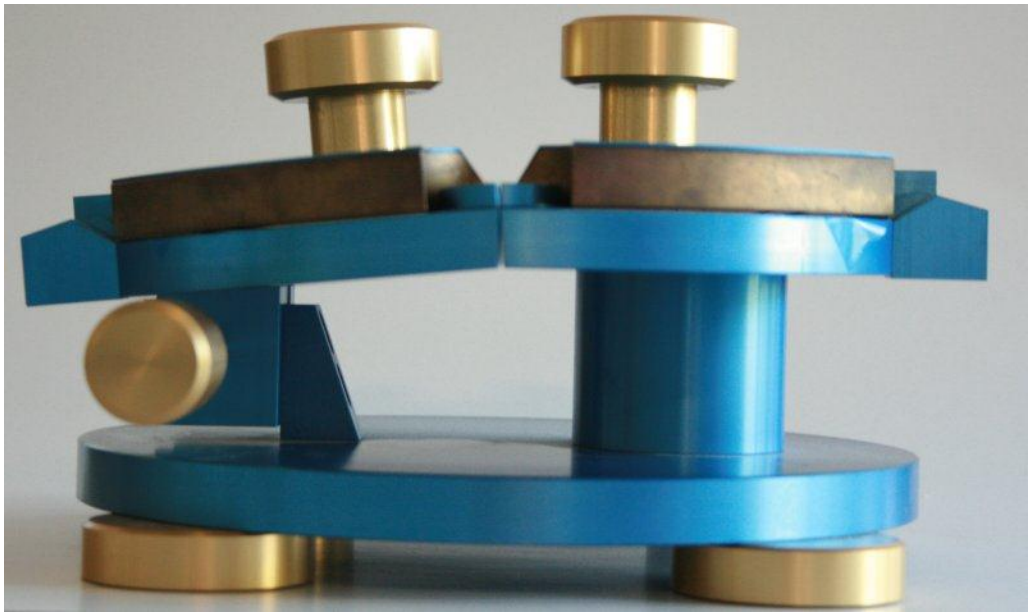
PECVD
Nitrogen

Different Ways of Cleaving

Optical micrograph, top-view



Wafer Brech Maschine
Courtesy PSI and Uni Bonn



R&D for Large-Scale Application

One of the key issues in making further progress is replacement of tweezer-based cleaving with better methods.

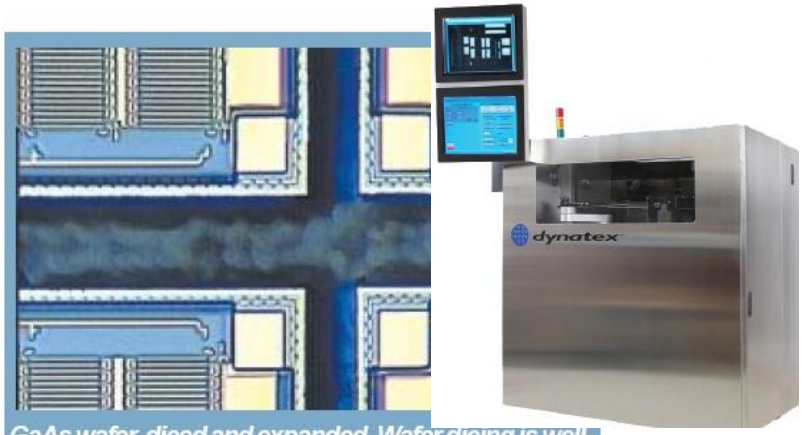
If somebody has a better machine, that could be shared or loaned, we are interested!

Looking at the industrial-scale cleaving machines:

- Dynatex machines seem nice. However we have a major delay in scheduling a test run with them.
- Loomis seem to be less automated, but suitable. Have started on a test run soon.

Dynatex International DTX-200-AB

AUTOMATED BREAKER PRODUCTION SYSTEM



GaAs wafer, diced and expanded. Wafer dicing is well-suited for UV DPSS lasers with their highly focusable, pinpoint-bright beams

LOOMIS Industries LSD-150

Redirection of Funds in Support of Cleaving

- Budget:
  - CHfr 32k for treatment at NRL
  - CHfr 16k for sensors

  We feel we have sufficient large n-type sensors

  But no experience with large p-type sensors

  Propose to acquire a few wafers from the new RD50 run ("Low R") at CNM for this (~ CHfr 3k)

  Possibility to acquire SMART sensors from FBK.
- Redirection:

  Would like to spend < CHfr 10k on contract work with industry (Loomis Industries), and constructing a "Waferbrechmaschine" (courtesy of PSI and Uni Bonn) in the UCSC University shop.

  The participating institutions have either agreed or have not voiced objection.