Actuator fabrication

- Improved SOI/DRIE process with notching release
  - PR mask patterning
  - DRIE etching
  - DRIE notching
  - (Wet release)

- High success yield even for this huge system (5x6 mm) with <2µm springs

Pattern dependent notching

- We found a dependency between notching in the DRIE and the width of trench pattern
- Largest notch achieved with trench A/R= 2

HB. Liu, F. Chollet, Layout Controlled One-Step Dry Etch & Release of MEMS using Deep RIE on SOI wafer, JMEMS 15, no 3 (2006)
One-step dry etch & release

We developed a set of rules to optimize the release of our structure:

A) For moving structure with large surface, use triangular mesh or other dense mesh with trench aspect ratio above 2 and proper line width.

B) Avoid wide trench (A/R<2) adjacent to moving structure.

C) Avoid wide moving beams.

D) Pay attention to the heat dissipation problem or take advantage of it.