

# Fabrication of Slanted Electrodes in MEMS Devices

---

## A method to fabricate microelectronic mechanical systems (MEMS) devices with horizontal and slanted electrodes

Georgia Tech inventors have developed a method to fabricate slanted electrodes along with vertical and horizontal electrodes. This method incorporates wet-etching, a material removal method using liquid chemicals, on single-crystal silicon to create vertical, horizontal, and slanted electrodes with sub-micro gaps. Customized masks with the desired pattern are applied to the silicon to protect material that will not be removed. Wet-etching is used to first create the slanted electrodes, then the horizontal electrodes. These slanted electrodes are able to replace complicated systems of electrodes with one or two electrodes.

### Summary Bullets

- **High Performance** – slanted electrodes provide more capabilities and possibilities for MEMS devices
- **Consolidated** – reduces the need for large systems of MEMS
- **Versatile** – MEMS with slanted electrodes can be applied to many applications

### Solution Advantages

- **High Performance** – slanted electrodes provide more capabilities and possibilities for MEMS devices
- **Consolidated** – reduces the need for large systems of MEMS
- **Versatile** – MEMS with slanted electrodes can be applied to many applications

### Potential Commercial Applications

- Gyroscopes
- Personal Navigation
- MEMS devices
- Healthcare

### Background and More Information

Slanted electrodes are very enabling in capacitive microelectronic mechanical systems (MEMS) devices. Conventional MEMS fabrication processes are only capable of creating capacitive transducers in vertical or horizontal directions. Many applications require a complicated series of MEMS to achieve the desired function, which can decrease efficiency and performance.

## **Inventors**

- Dr. Farrokh Ayazi  
Professor and Director of Integrated MEMS (IMEMS) Laboratory – Georgia Tech School of Electrical and Computer Engineering
- Dr. Haoran Wen  
Postdoctoral Fellow – Georgia Tech School of Physics
- Anosh Durawalla  
Graduate Research Assistant – Georgia Tech School of Electrical and Computer Engineering

## **IP Status**

:

## **Publications**

, -

## **Images**

Visit the Technology here:

[Fabrication of Slanted Electrodes in MEMS Devices](https://s3.sandbox.research.gatech.edu/print/pdf/node/3615)

---

<https://s3.sandbox.research.gatech.edu/print/pdf/node/3615>