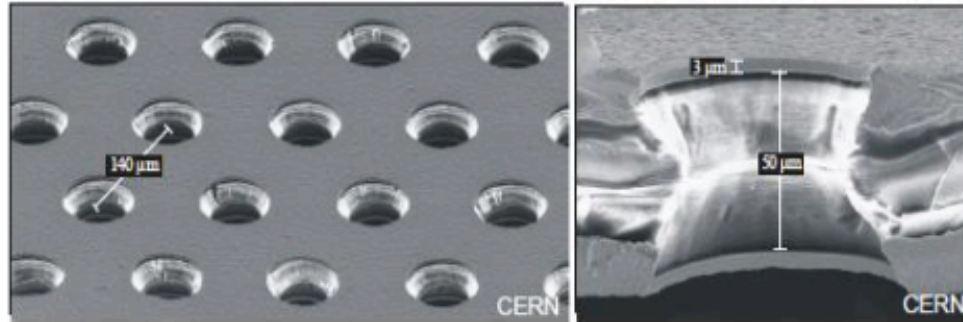
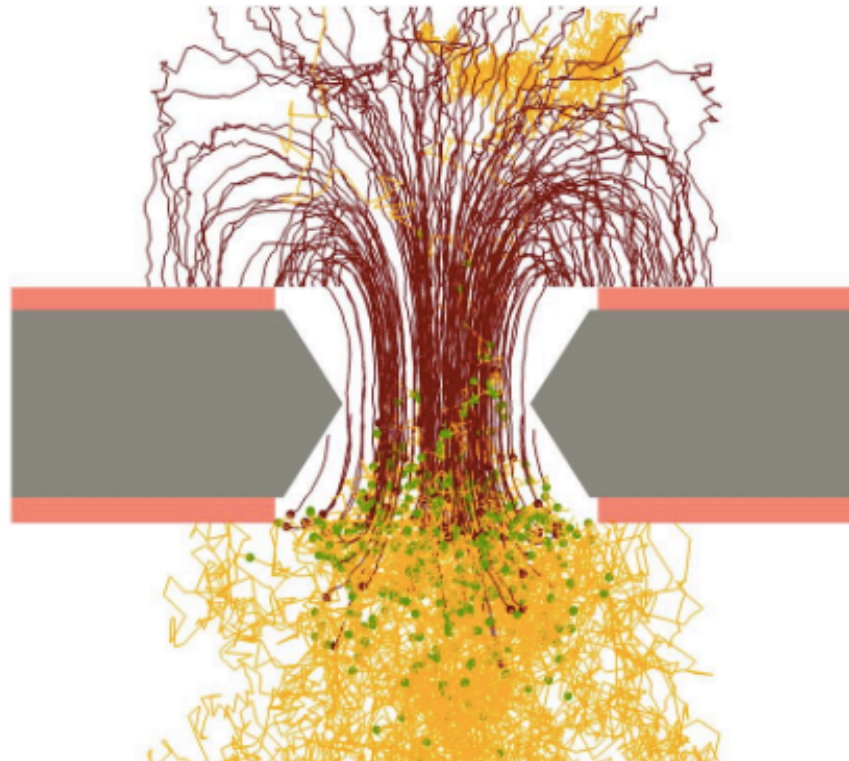


GAS ELECTRON MULTIPLIERS

FOR min IBF



Electron microscope photograph of a GEM foil



- Micro-patterned gas detector for electron multiplication
- Proven to work reliably in high-rate applications

**In a TPC with continuous readout:
back-drifting ions into drift space**

- **Ion backflow (IBF)**: fraction of effective number of ions produced during gas amplification
- **ϵ -parameter**: number of back-drifting ions per primary electron:

$$\text{IBF} = I_{\text{cathode}} / I_{\text{anode}}$$

$$\epsilon = \text{IBF} \times \text{gas gain}(=2000)$$

**→ IBF can be minimized by optimization of
GEM geometry and field configuration**



- 2015: Full-size 4-GEM OROC
 - *School of ROC (March 8 – April 17, 2015):* Physicists and technicians from institutions involved in ROC production participated in GEM framing and assembly for OROC at TU Munich and CERN
 - hands-on experience
 - optimization of tooling and testing
 - define common standards and procedures
- big step towards readiness for start of series production

CMS : The GE1/1 design

