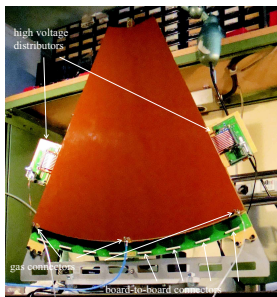


LARGE GEM DETECTOR

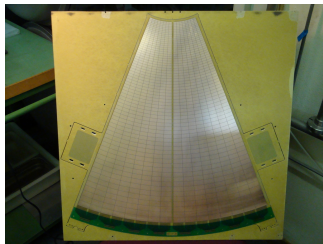
Padded readout board



Large GEM chamber (66×66 cm) based on two novel techniques: single mask technique and GEM splicing.

Padded readout structure: small pads with long traces in the top, big pads with short traces below.

In any case no charge sharing between channels.



OBJECTIVES & REQUIREMENTS

Efficiency & homogeneity

Objectives

- Efficiency
- Homogeneity of gain and efficiency
- Readout structure issues:
 - large capacitance — *due to big pads*
 - crosstalk — *due to long traces*

Requirements

- Gas: Ar/CO₂ (70/30%) — *Volume of chamber is 1.8 l, flush at ~ 10 vol/h*
- High voltage: 2 channels ≤ 5 kV — *2 resistive dividers, current per div. ≤ 1 mA*

4 Front-end chips available

- 1 Gassiplex — One front-end module (96 channels) + DAQ available
- 2 APV — Two front-end hybrids available, should work with ARC DAQ developed in Helsinki for TOTEM, which we can borrow
- 3 VFAT — Availability uncertain, need help from TOTEM
- 4 GP5 — Commercial chip, developed into a hybrid with portable DAQ; doesn't seem to be fully efficient



All of these are compatible with our standard 130-pin board-to-board connector (Gassiplex trough an adapter board).

Depending on availability and support we can try one or a few of these, either in June or in October.