Laboratoire d'Annecy-le-Vieux
de Physique des Particules

# DHcal structure

# &

# 1m² Micromegas chamber

*European DHcal meeting*
June 2008, 13th
*- CERN -*

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE

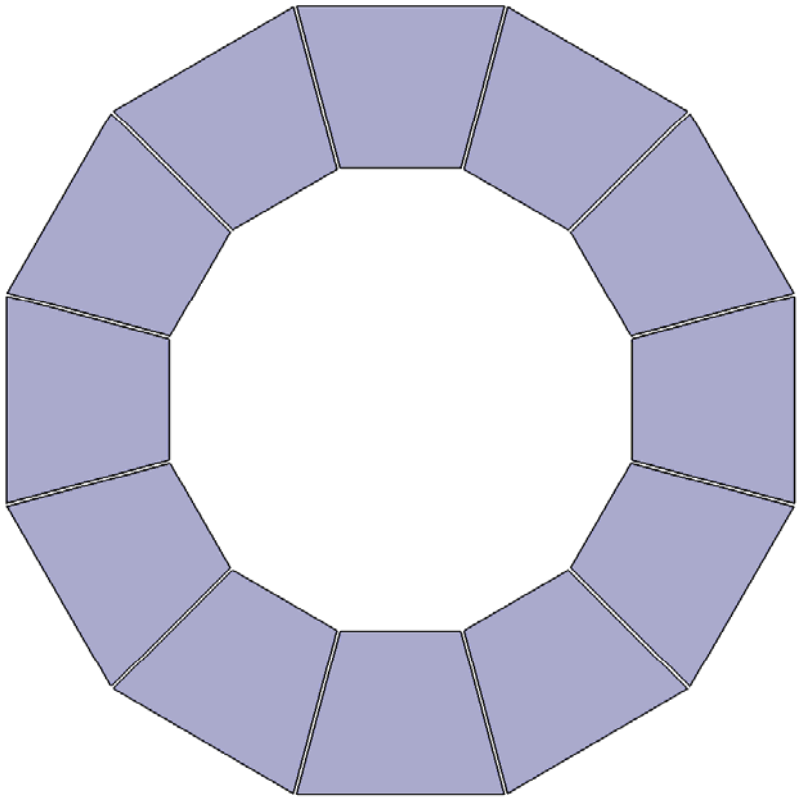
IN2P3
INSTITUT NATIONAL DE PHYSIQUE NUCLÉAIRE ET DE PHYSIQUE DES PARTICULES

UNIVERSITE CHAMBERY ANNECY SAVOIE

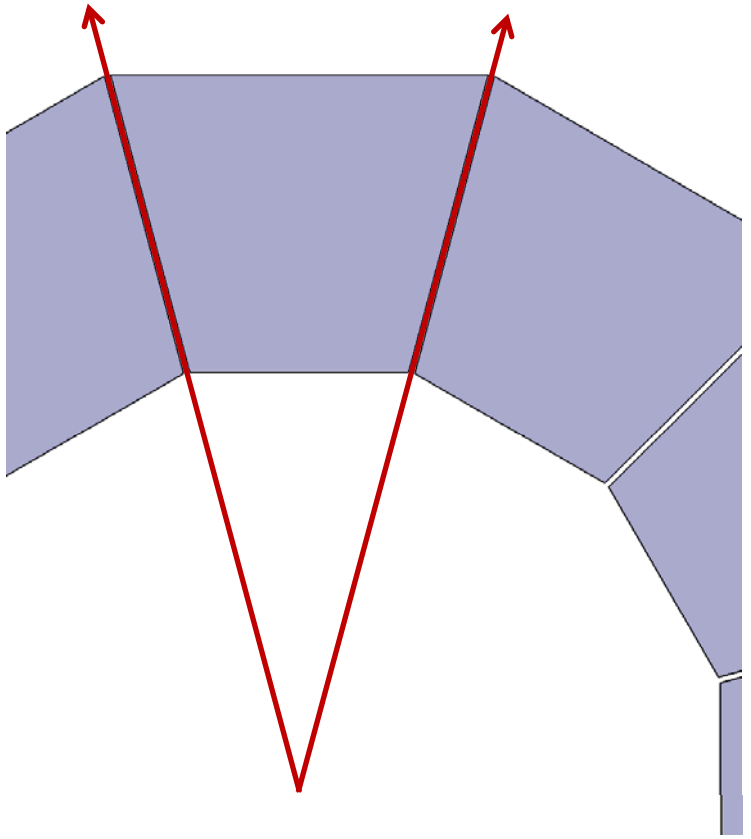
# Study of a new Hcal geometry…

***…motivation: « cracks » in the calorimeter***

*( muons are lost, hadrons ? )*



*Classical geometry*



# Study of a new Hcal geometry…

***- 1st version -***

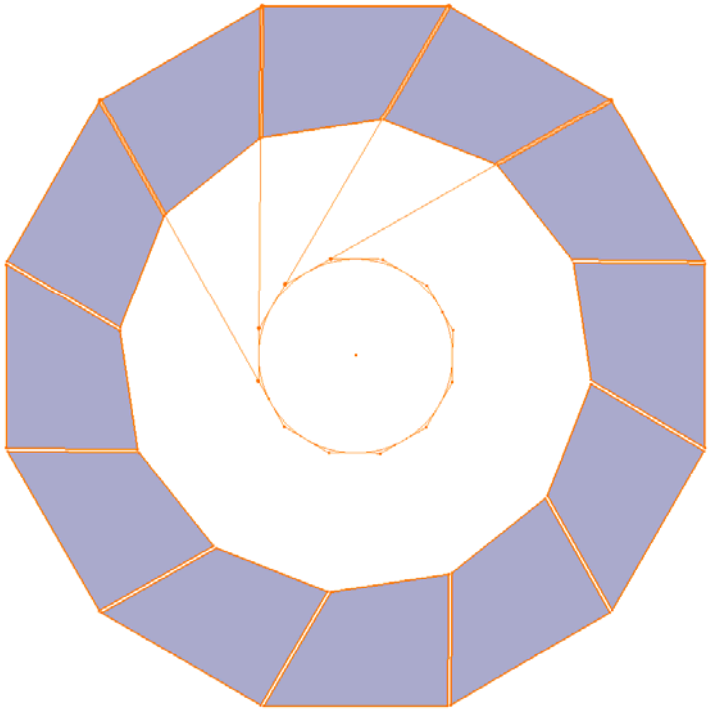
*In order to avoid cracks, the edges should not point to the center of the barrel*

➡ ***Proposal of a first tilted geometry***

***First version :***

*The edges are **tangent to a circle**, centered on the beam axis.*

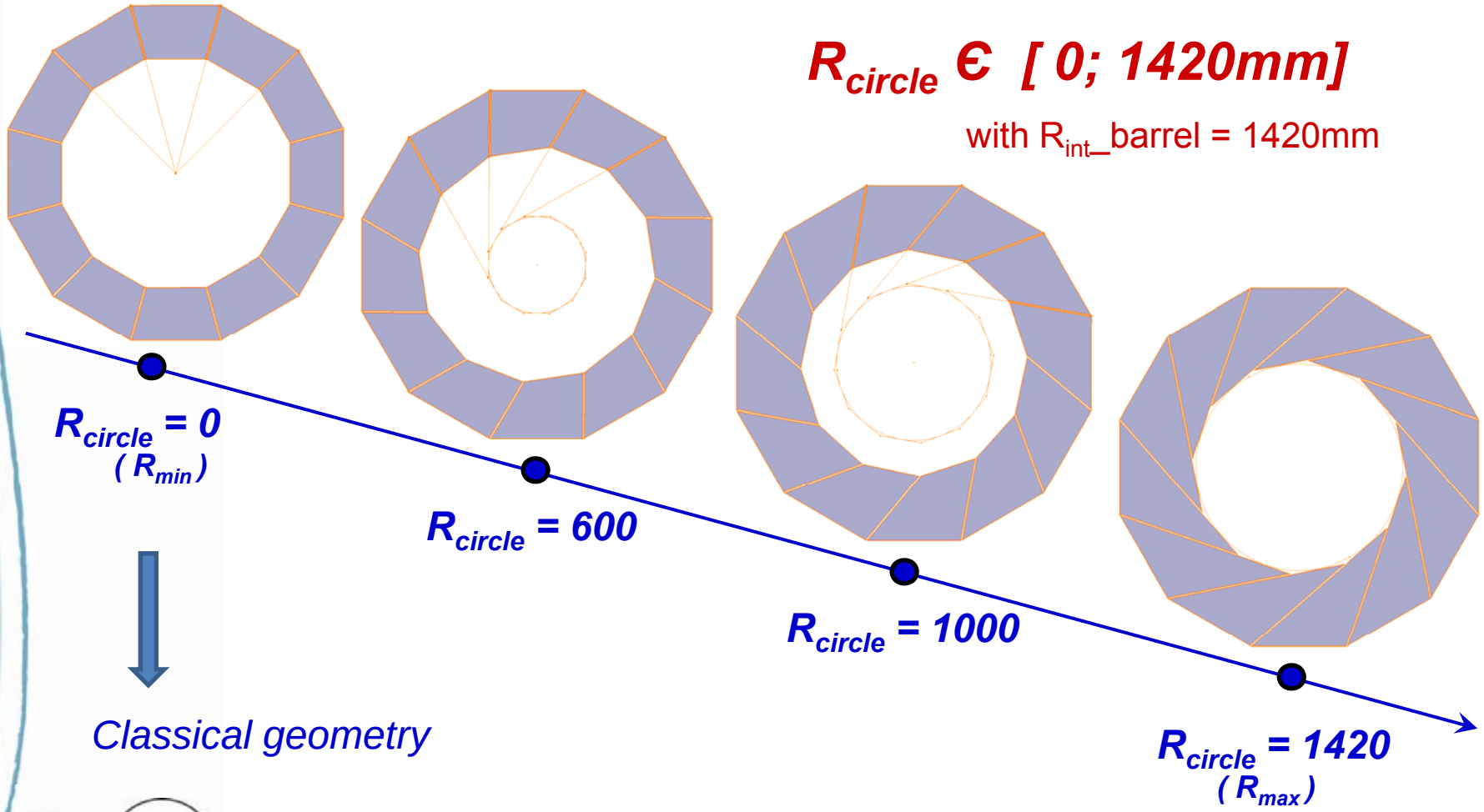
*The **circle radius** is the parameter which determinates the tilt level*



# Study of a new Hcal geometry…

***- 1st version -***

*Examples of tilt level as a function of the tangent circle radius*



# Study of a new Hcal geometry…

***- 2nd version -***

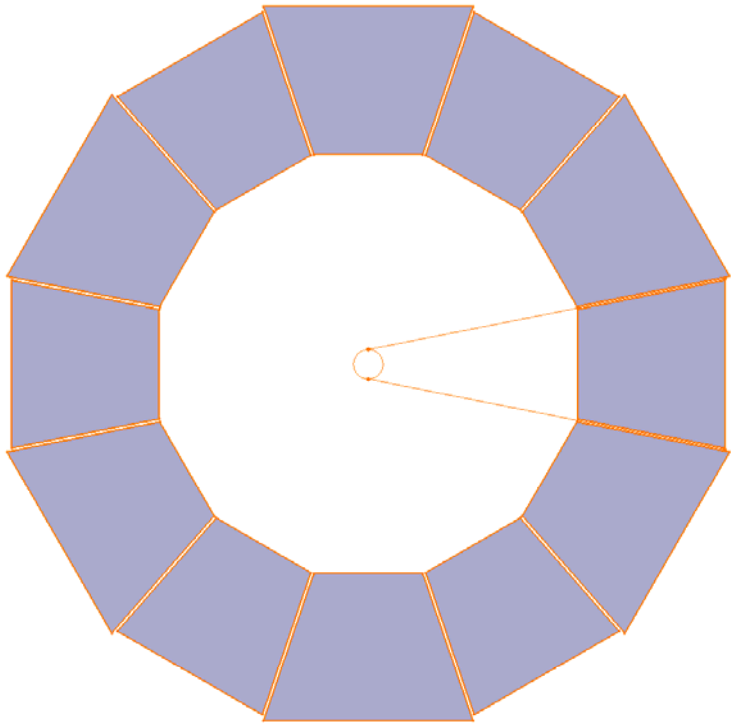
*In order to avoid cracks, the edges should not point to the center of the barrel*

➡ ***Proposal of a second tilted geometry***

***Second version :***

*The 2 edges of a module are* ***tangent to a circle, in an opposite way***

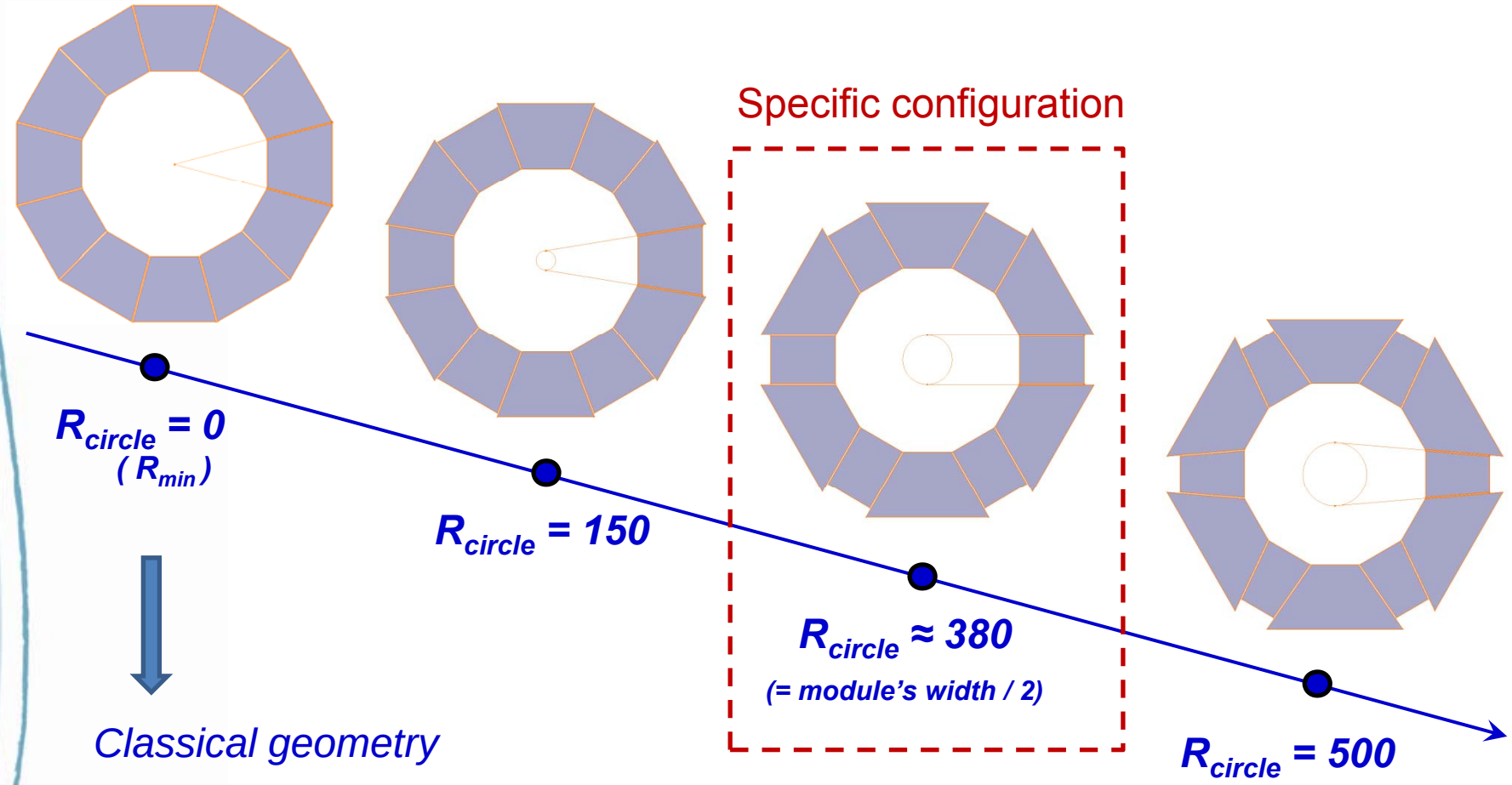
*The* ***circle radius*** *is the parameter which determinates the tilt level*



# Study of a new Hcal geometry…

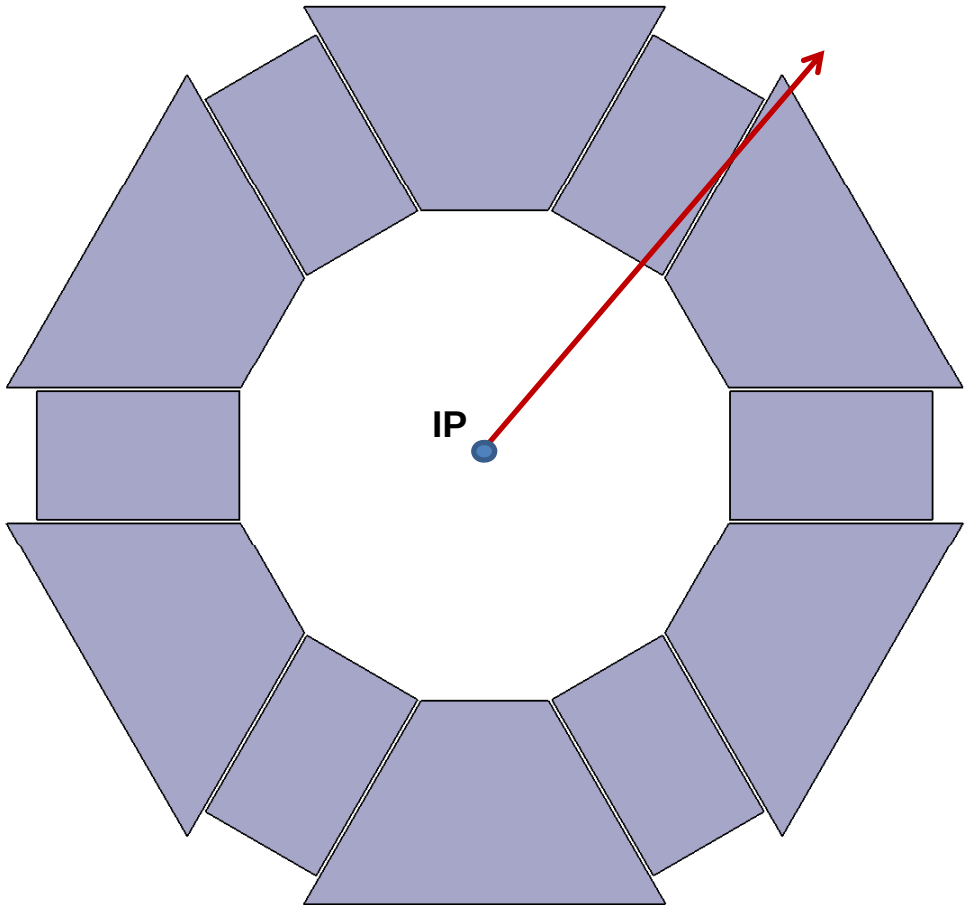
***- 2nd version -***

*Examples of tilt level as a function of the tangent circle radius*



# Study of a new Hcal geometry…

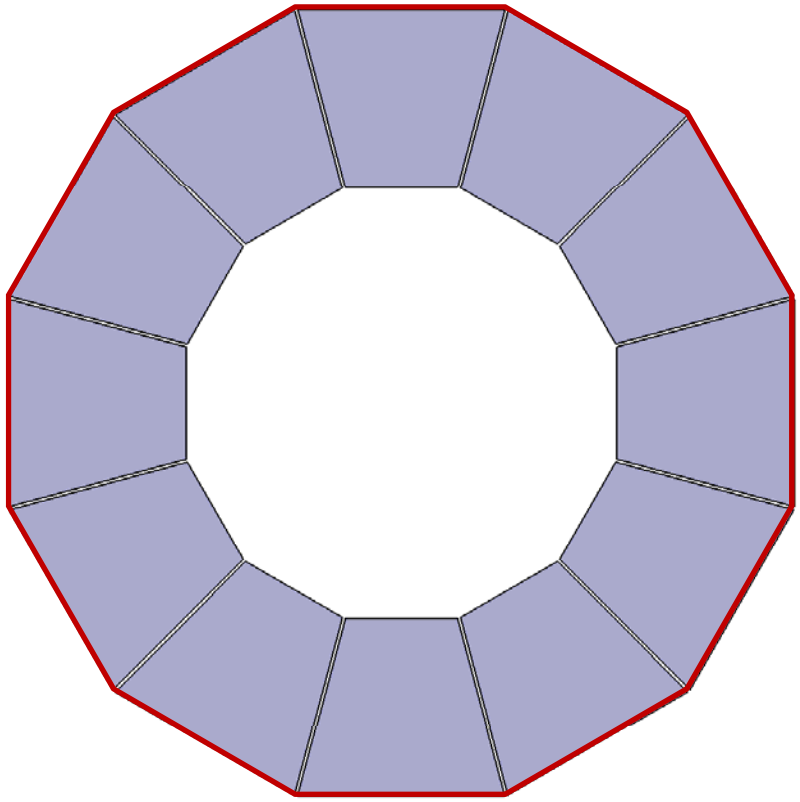
***Tilted configuration avoiding cracks***



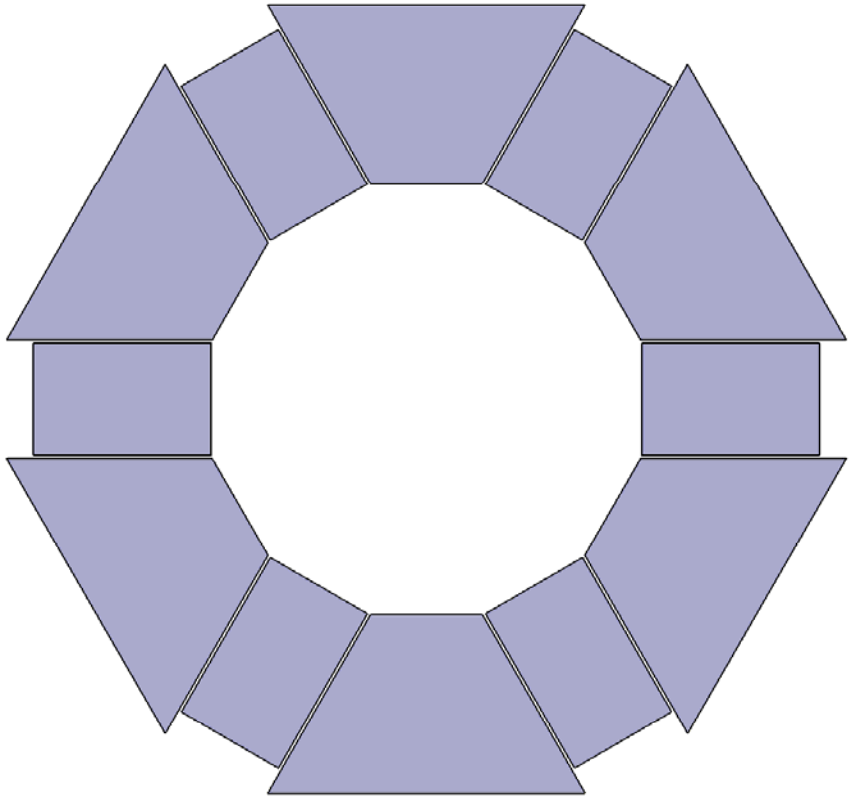

***Symmetric shape !***

# Study of a new Hcal geometry…

*Projective configuration*



*Tilted configuration*

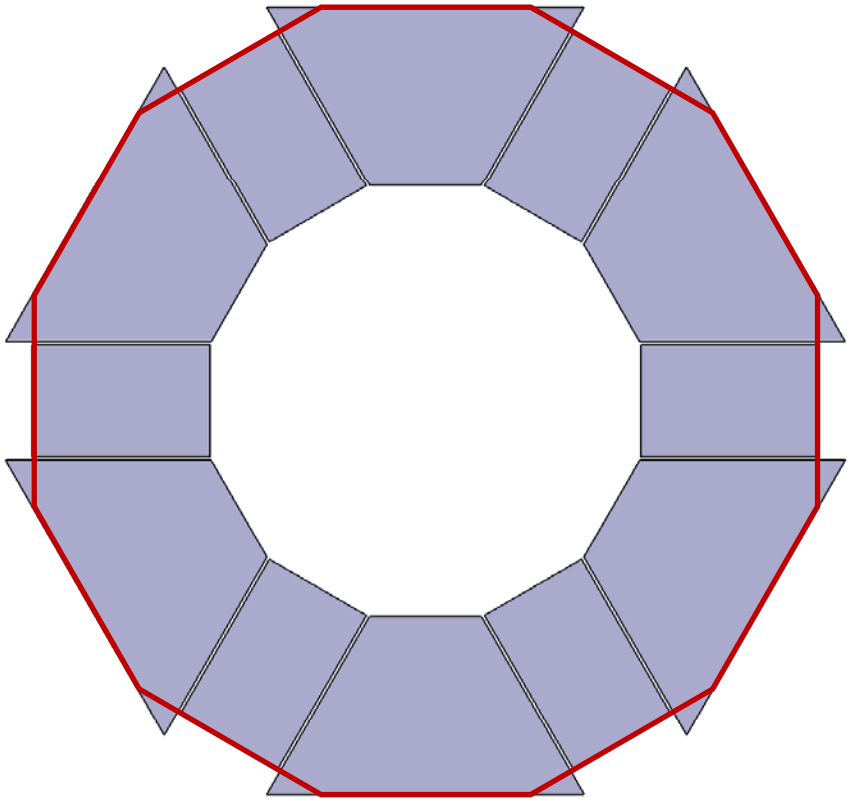


Minimum overall dimension

# Study of a new Hcal geometry…

## *new idea*

Number of $\lambda_i$ unchanged !



Minimum overall dimension

***Tilted configuration***

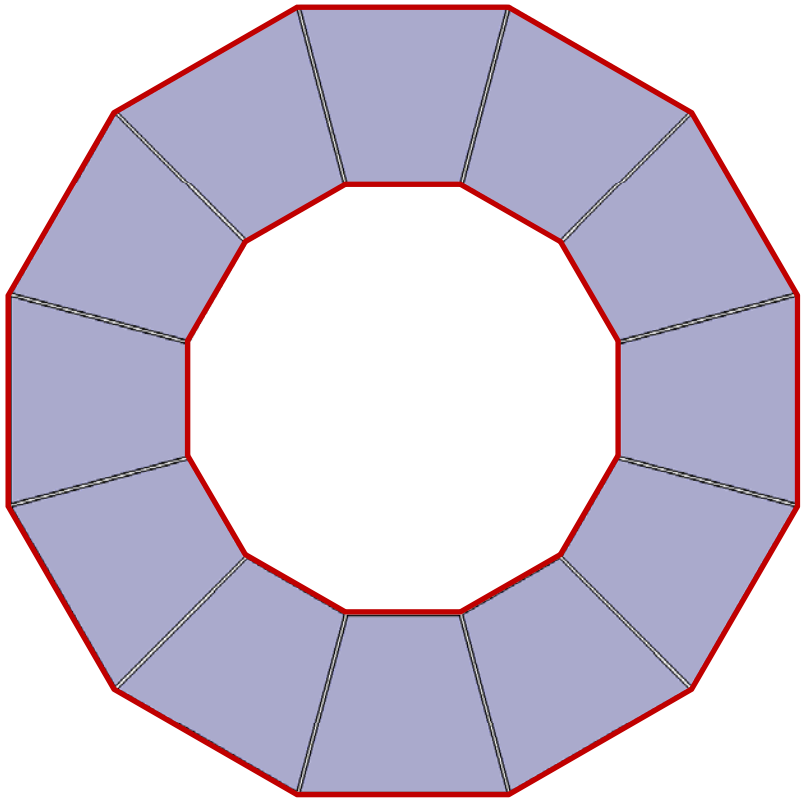


***Tilted & optimized configuration***

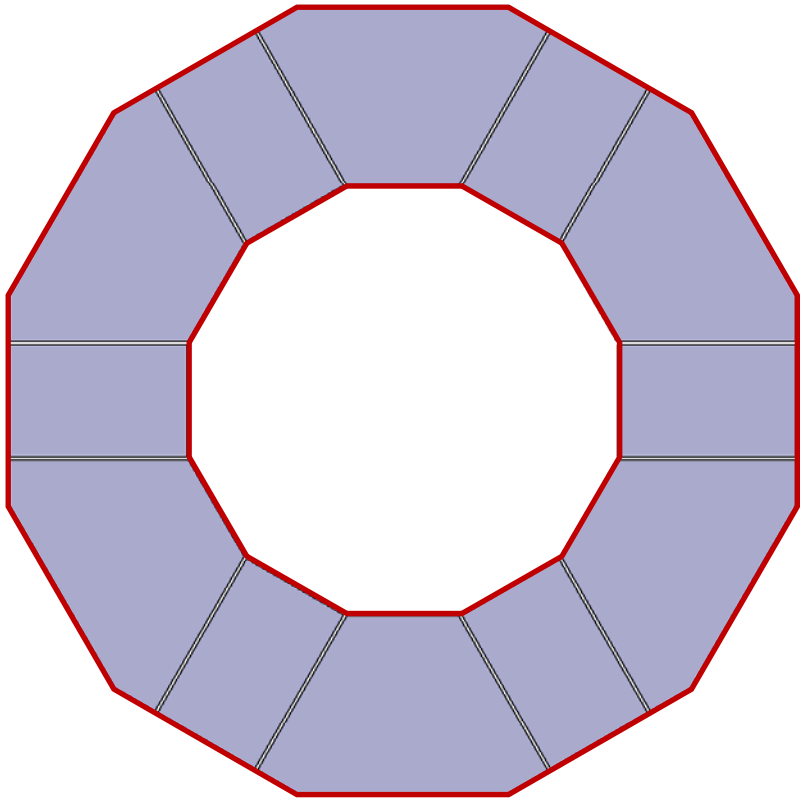
Configuration with :
- 6 rectangles
- 6 pseudo-trapezoids

# Study of a new Hcal geometry…

*Projective configuration*



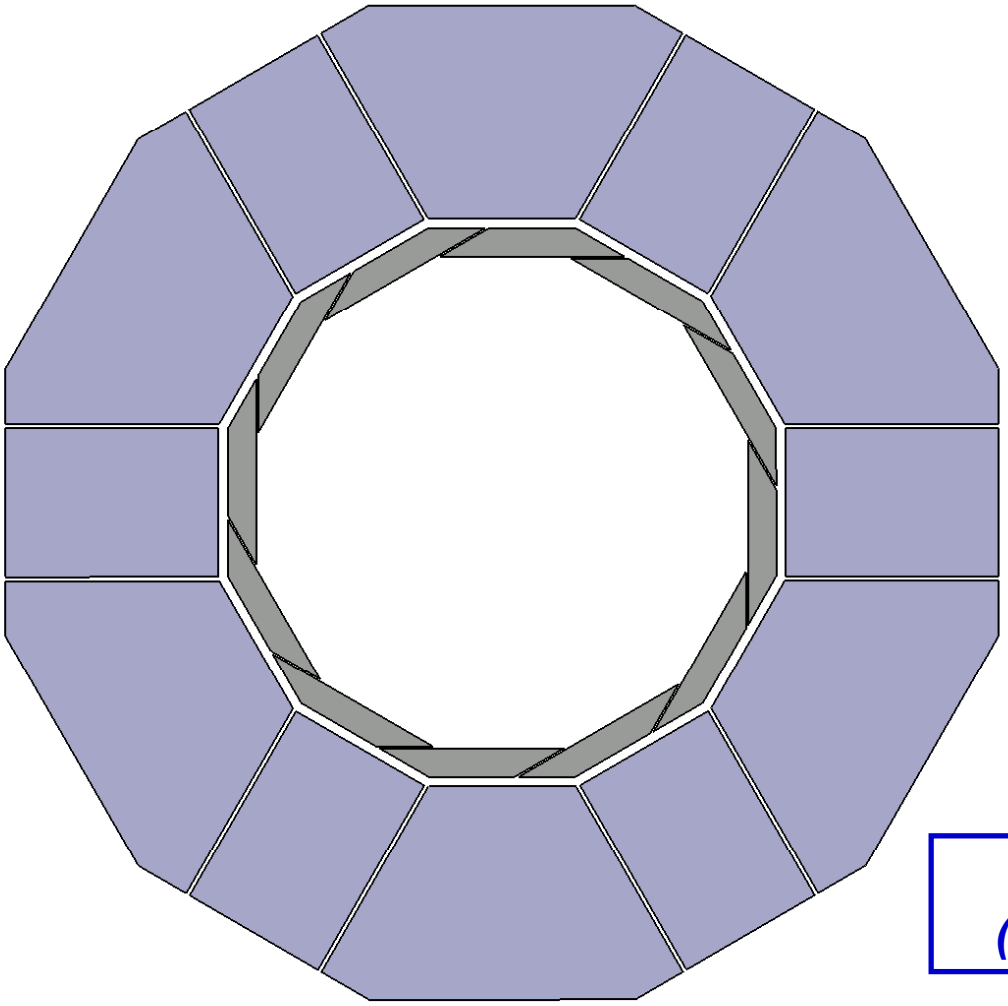
*Tilted & optimized configuration*



*Same internal & external boundaries*

***(2 regular dodecagons)***

# Study of a new Hcal geometry…



12 Modules' bottom :
same dimensions

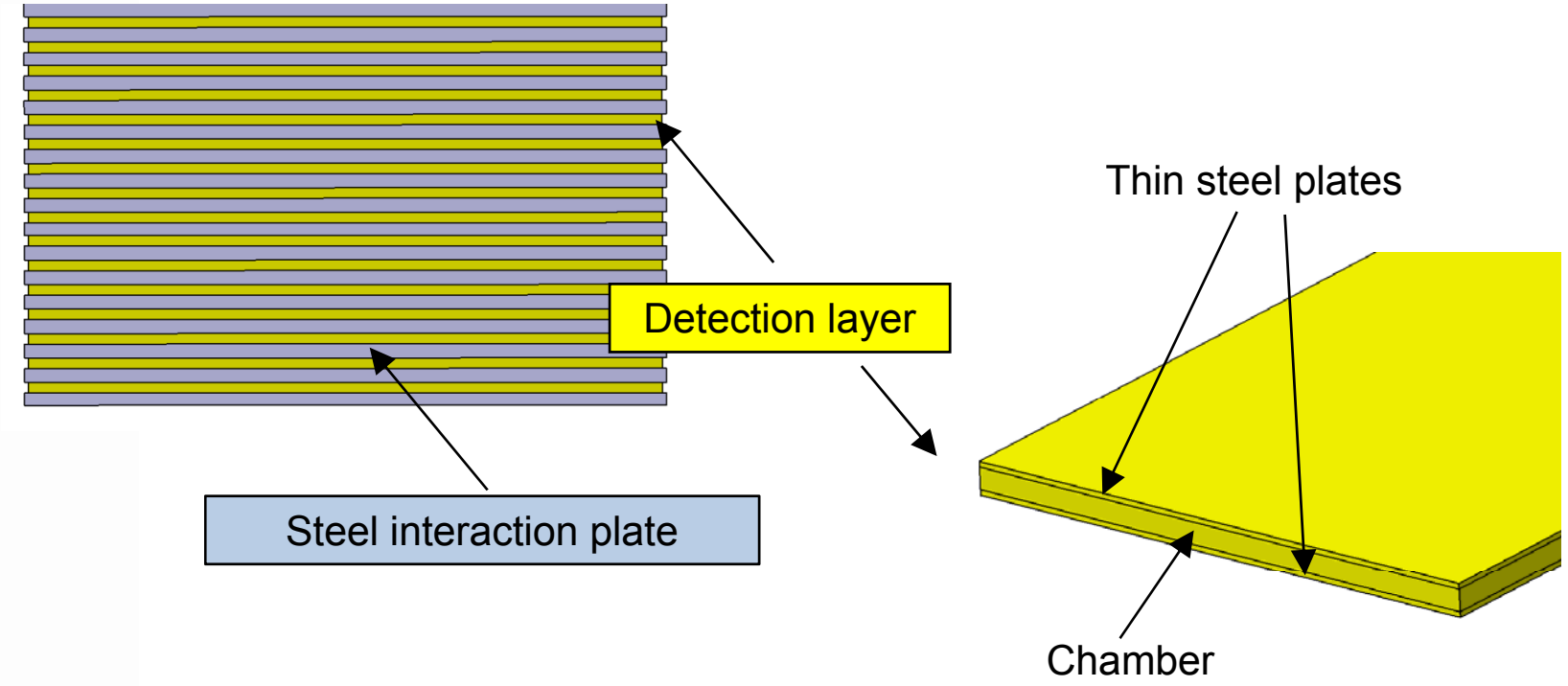
⬇

Easy integration of Ecal

***No cracks crossing***
***(neither in Ecal nor in Hcal)***

# Detail of Micromegas chambers

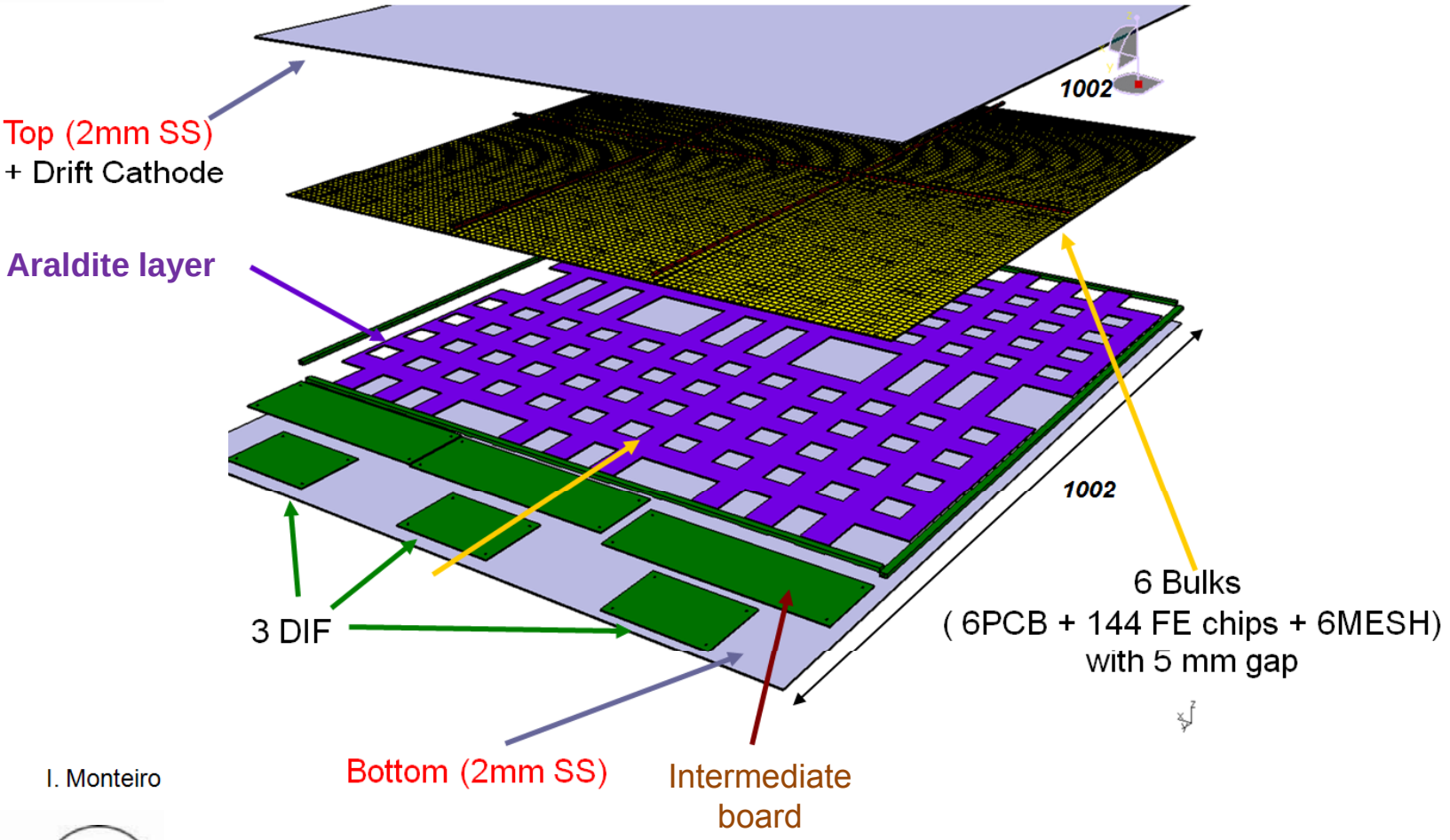
*Zoom of a rectangle module*




A detection layer (“sandwich part”) consists in a chamber rigidified with two thin steel plates.

→ **Protection and stiffness !**

# Micromegas chamber : 1m² prototype




I. Monteiro

# Micromegas chamber : 1m² prototype