



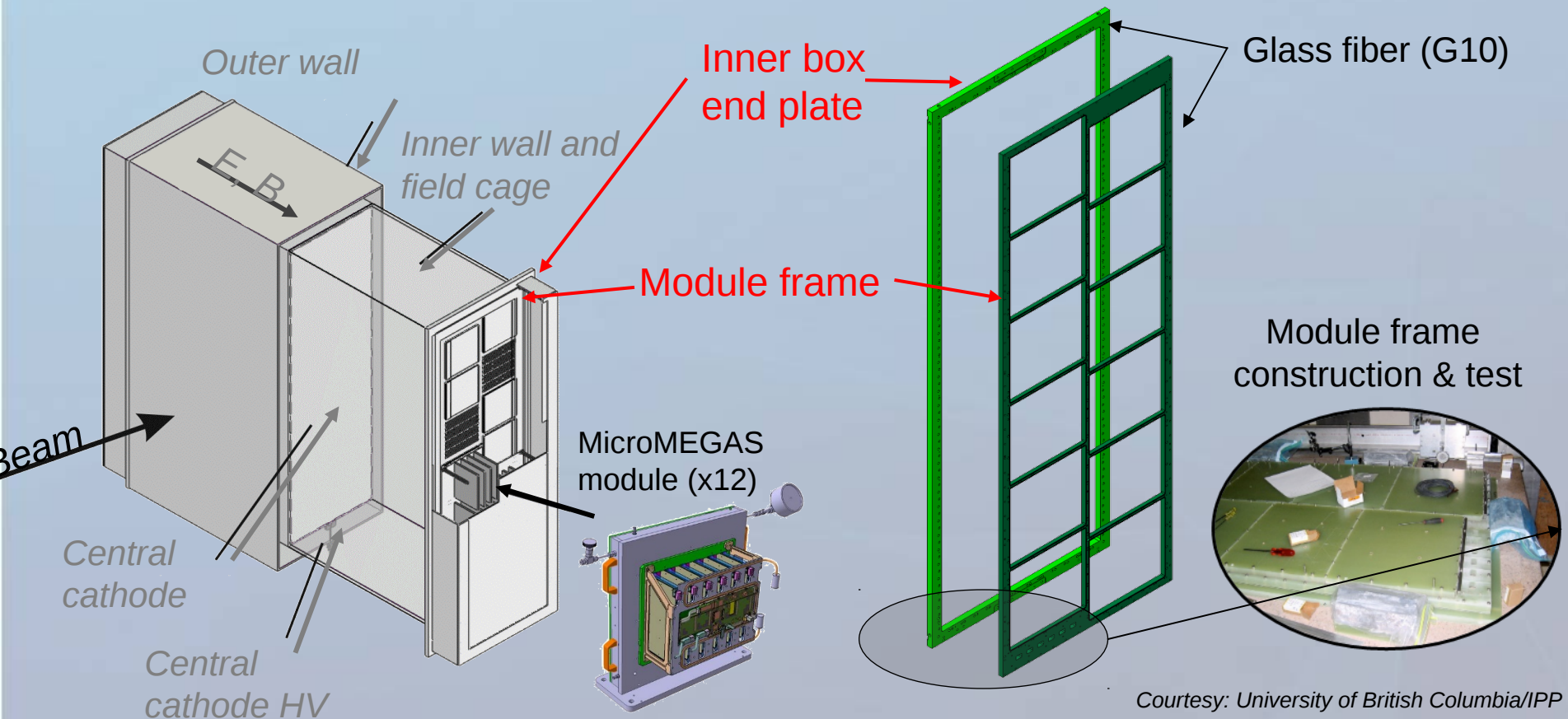
The Henryk Niewodniczański
Institute of Nuclear Physics
Polish Academy of Sciences

Possible contribution of IFJ PAN



Marcela Batkiewicz, Jerzy Michalowski, Jacek Swierblewski

Existing Time Projection Chamber

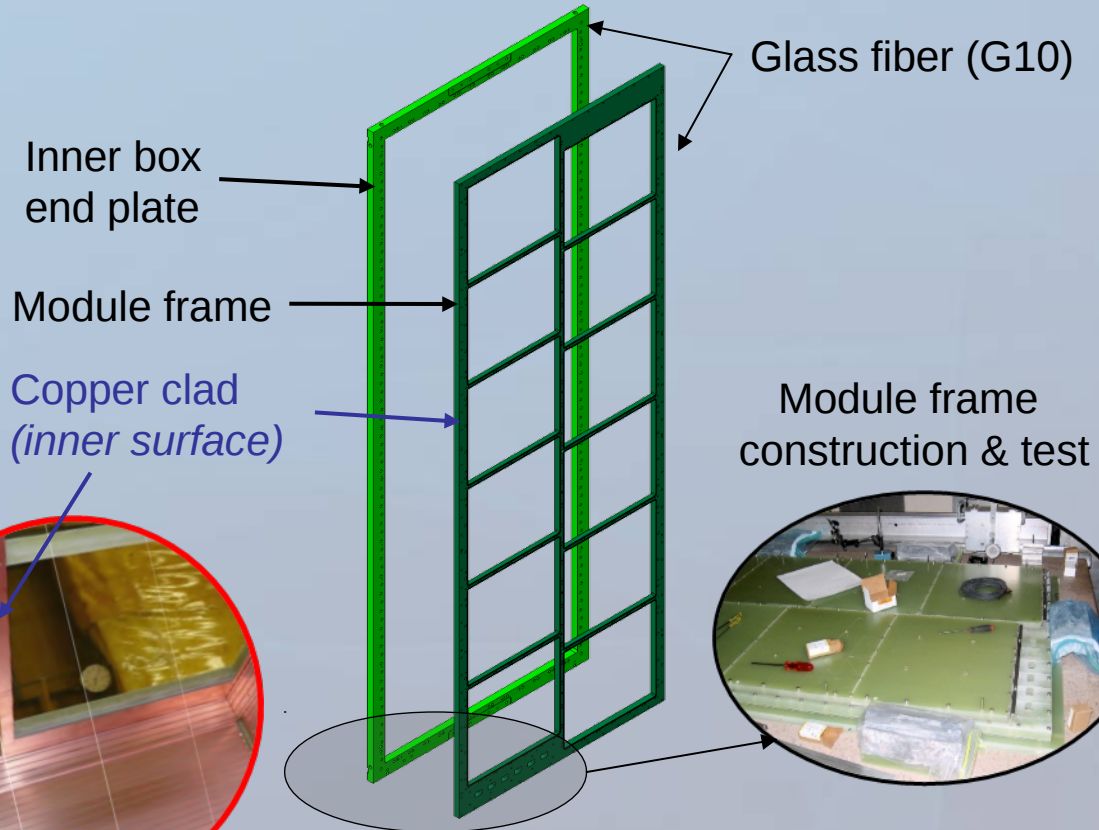


Existing Endplate & Module Frame



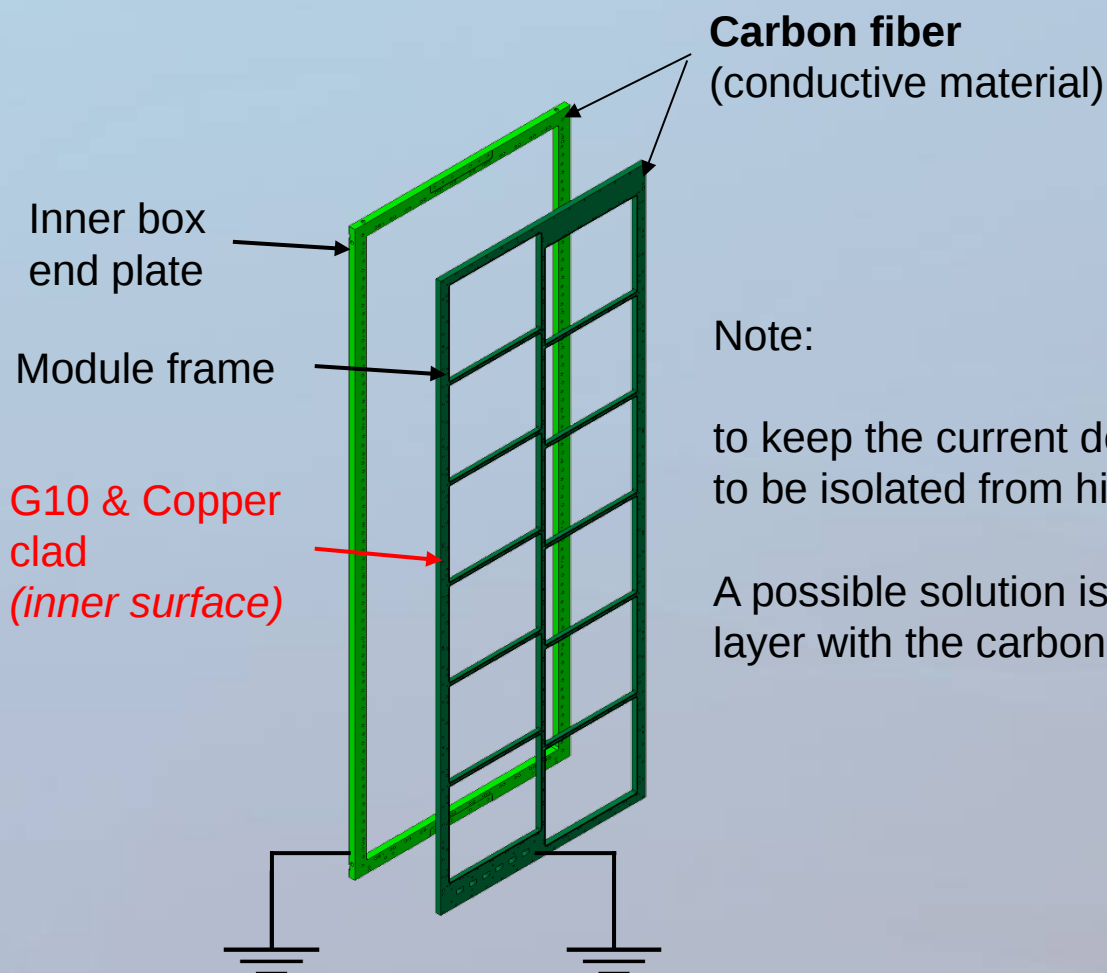
Dummy modules assembly

Courtesy: NSERC Review 2008
D. Karlen / U. Victoria & TRIUMF
representing the T2K ND280 TPC
group



Courtesy: University of British Columbia/IPP

Proposed Endplate & Module Frame

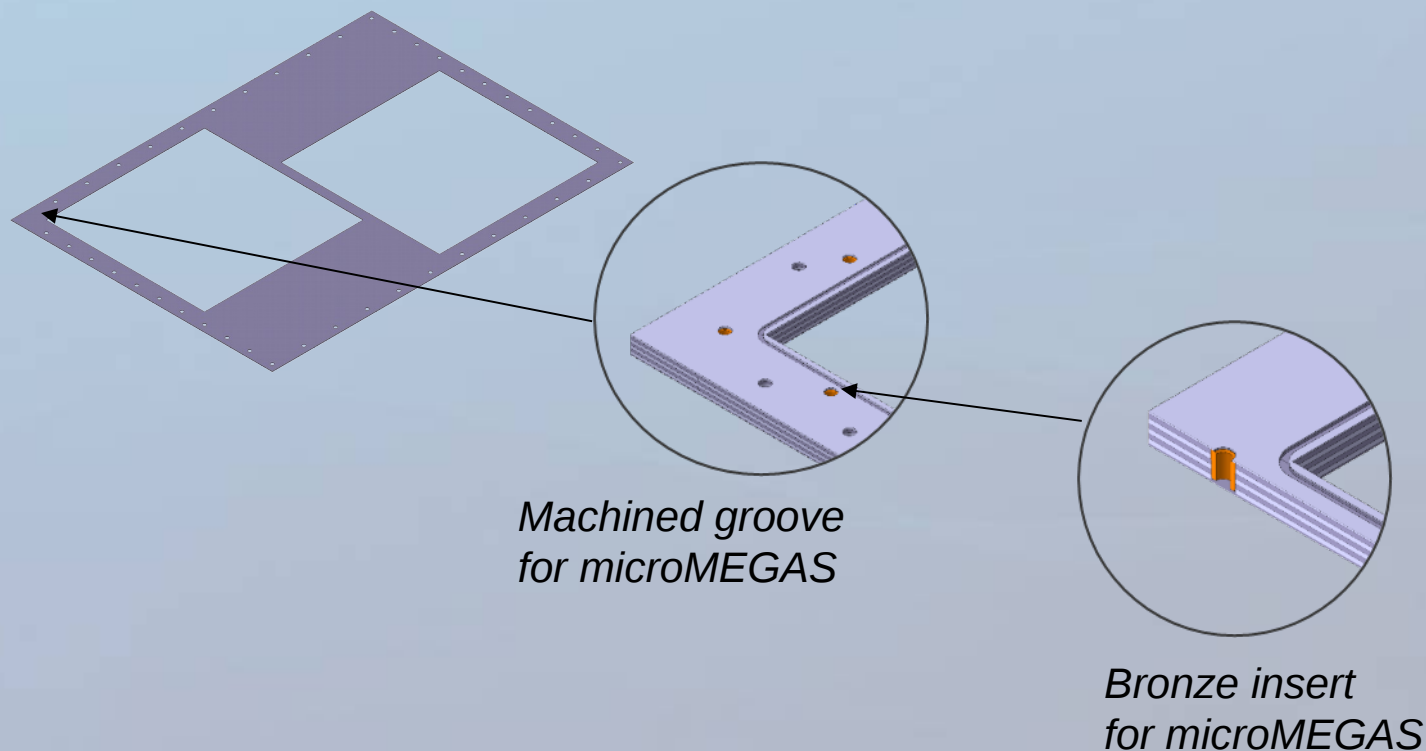


Note:

to keep the current design, the carbon fiber frames have to be isolated from high voltage.

A possible solution is to combine a copper clad G10 layer with the carbon fiber frames

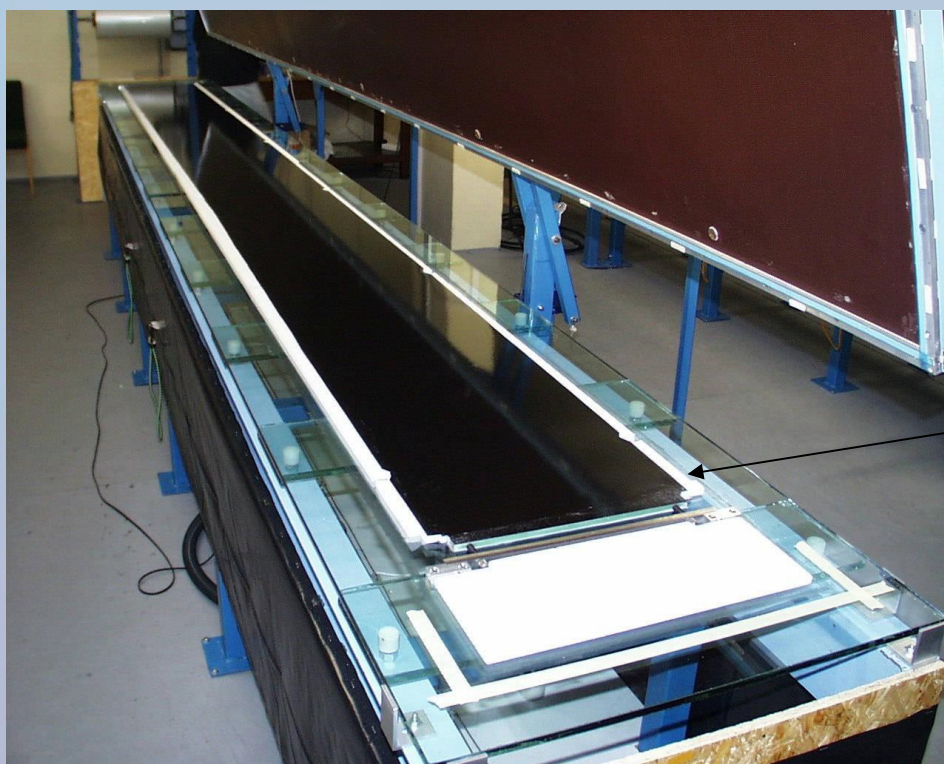
First prototype of carbon fiber module frame (0.8m x 0.6m x 0.015m)



Examples of carbon composite applications

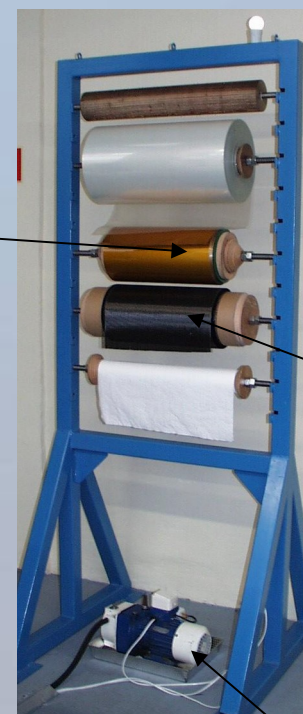
LHCb Experiment - panels for Outer Tracker Detector (5m x 0.5m x 0.01m)

November 2003



Cooper clad
kapton

Rohacell foam



Carbon fiber
tissue

Vacuum pump

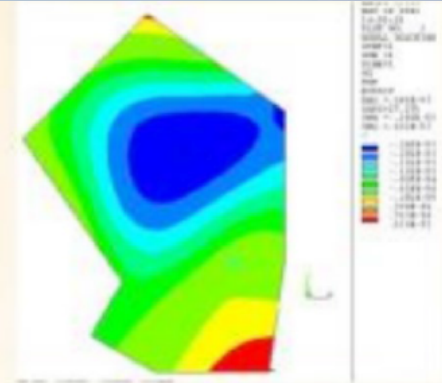
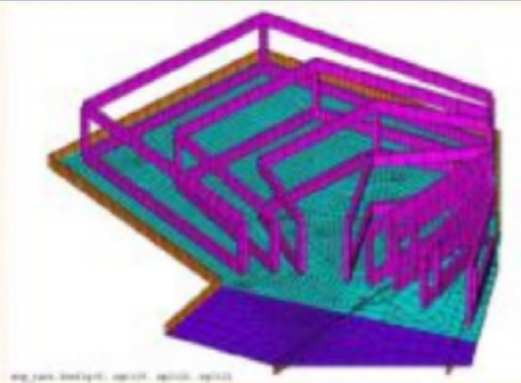
Examples of carbon composite applications

Experiment PHOBOS at RHIC, Brookhaven National Laboratory, USA 1993 - 2000



Mechanical structures

- R&D
- Prototyping
- Design
- FEM calculation
- Fabrication
- Assembly



Carbon-epoxy base plate and aluminum cooling frames for silicon detectors of two-arm spectrometer(left), their ANSYS model(center) and calculated vertical displacements of the base plate(right)

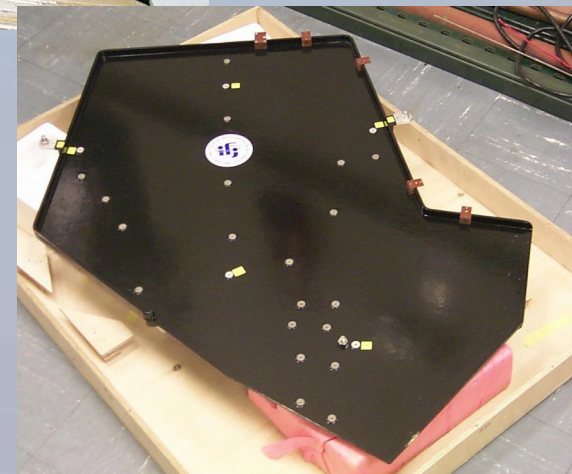
Carbon-Epoxy Composite Base Plates for the PHOBOS Spectrometer Arms



Plywood mold prepared for lamination of unidirectional carbon fiber reinforcing ribs



Carbon-epoxy composite sandwich plate - laminated





Funding

IFJ PAN got a funding for 2017 and 2018 for a design and prototyping (21k euro for materials) of TPC end-plates and support structures for MicroMegas and FE cards.

Funding application for a proper (non-prototype) structures will be written in 2018.