The MoEDAL Very High Charge Catcher (VHCC)

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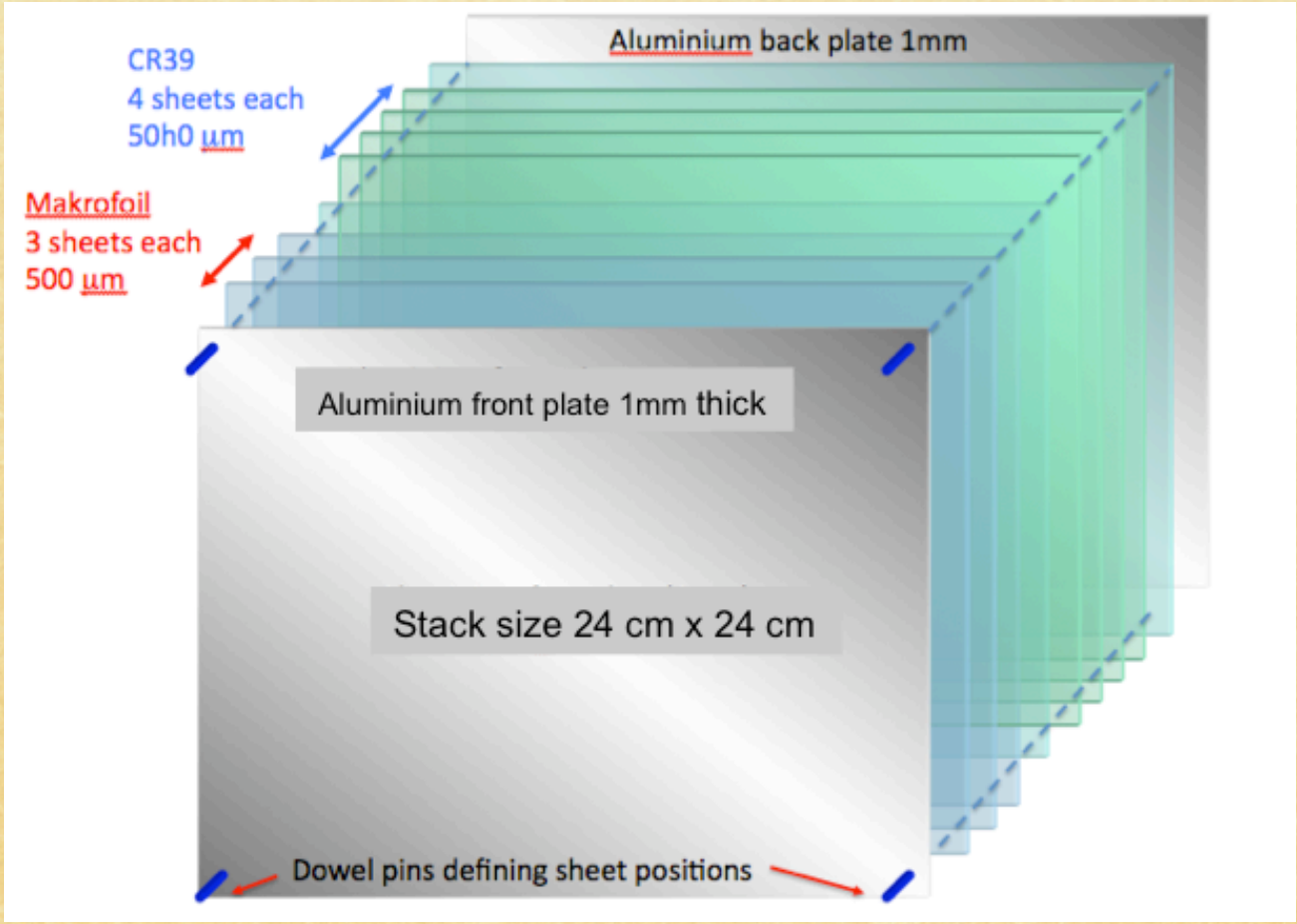
The TDR Detector Array (1)

- The MoEDAL array described in the TDR is comprised of stack of Nuclear track detectors with different thresholds
  - CR39 with threshold $Z/\beta \geq \sim 5$
  - Makrofol with threshold $Z/\beta \geq \sim 50$
- These stacks are ~ 7mm thick and rigid housed in flat thin (1mm) aluminium housings and need to be deployed on the walls of the VELO-MoEDAL cavern to allow access to the VELO detector.
- The weight of eight aluminium housing (containing 6 25x 25 cm^2 stacks weigh a few kilograms.

The MoEDAL Stack Described in the TDR

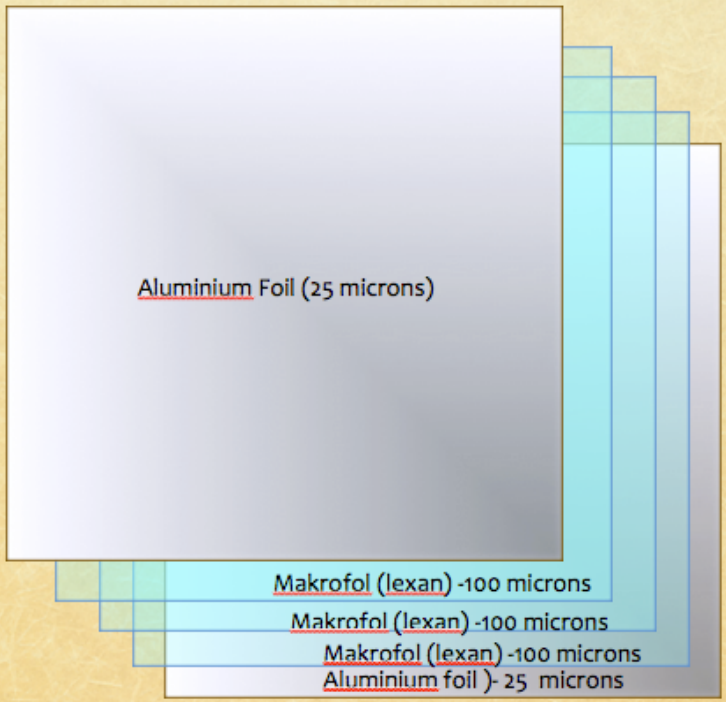


The TDR Detector Array Deployment

- The array described in the TDR is deployed on the VELO cavern walls as it is for a number of reasons:
  - Because a large rigid structure might impede emergency access to the VELO detector
  - Because a large rigid structure might impede the cooling of the VELO detector
  - To avoid placing too much material between the front end of the VELO and the downstream LHCb detectors
  - To avoid placing rigid multi-kilogram structures on existing LHC detectors no specifically designed to be utilized in such a manner

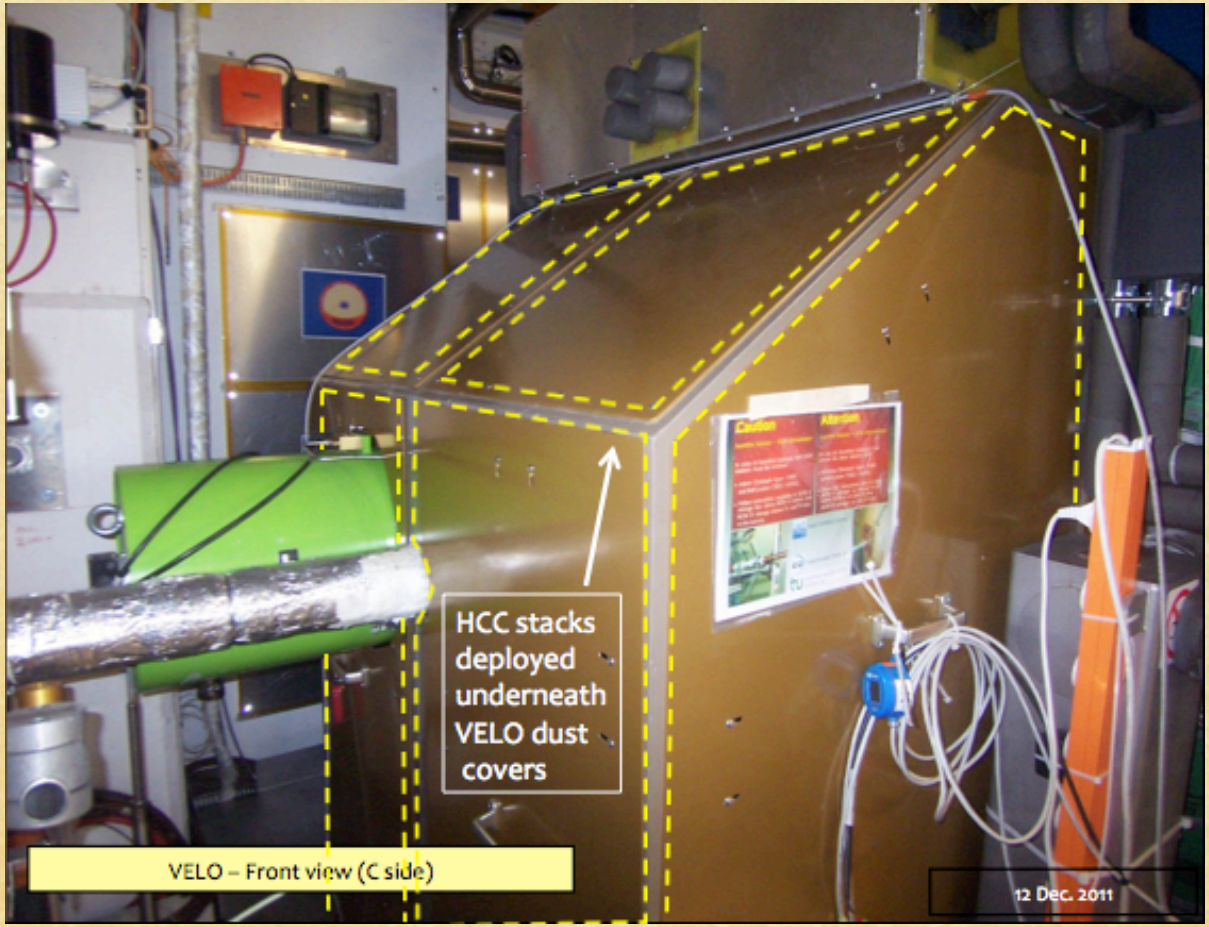
The Very High Charge Catcher

- The Very High Charge Catcher (VHCC) is comprised of flexible, thin bendable, light weight, plastic stacks (see sketch)
- It is comprised of a stack of 3 Makrofol (lexan) sheets each 100 microns thick encased in a aluminium foil (25 micron thick) envelope (to inhibit flammability)
- Normal size of each stack will be 50 x 50 cm^2 · The thickness of each stack is 0.65% of a radiation length total.
- The VHCC stacks can be placed in areas that were previously inaccessible



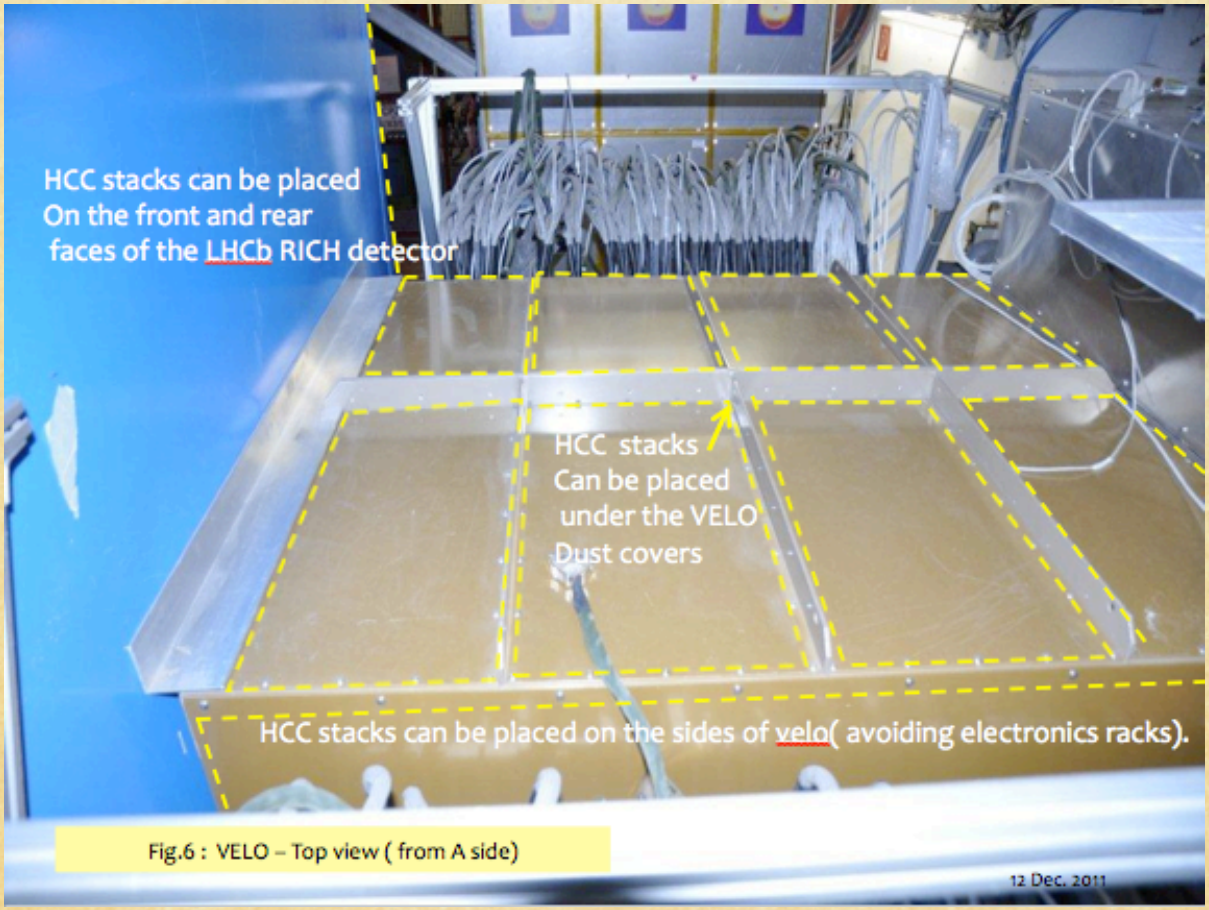
The VHCC stack

The VHCC Deployment (1)



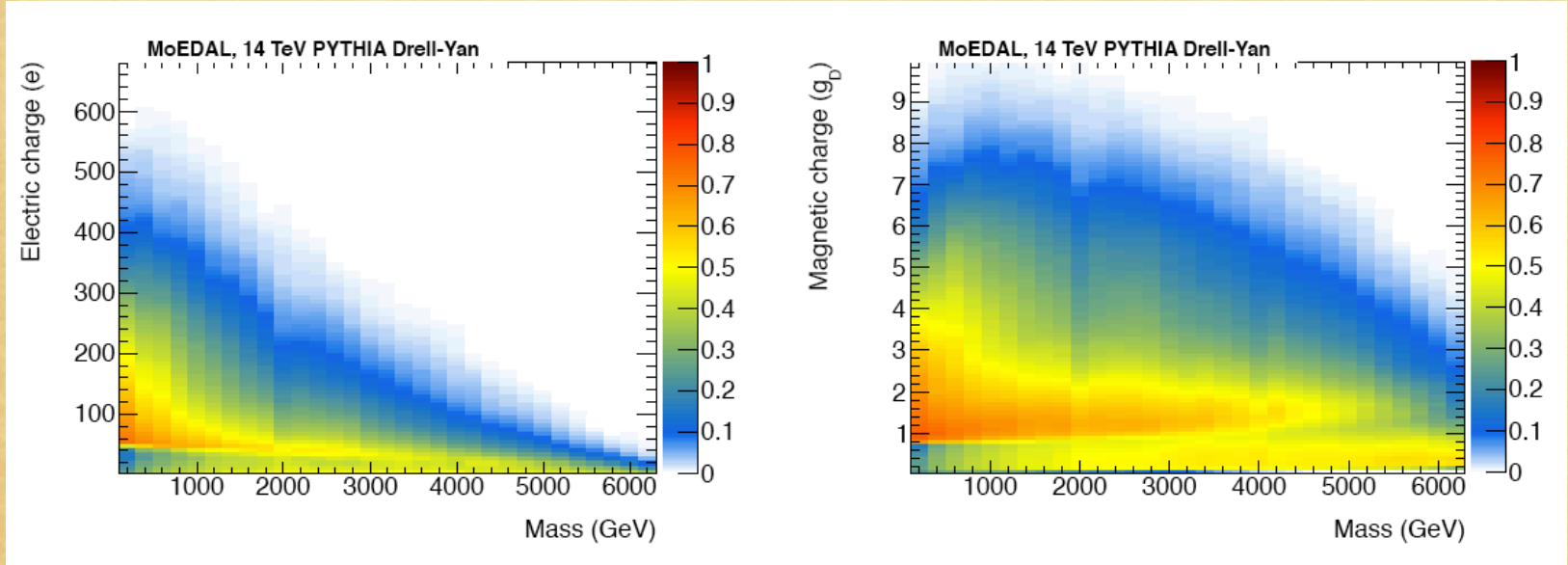
- The dashed lines delineate the edges of the VHCC stacks deployed *underneath* the VELO dust covers

VHCC Deployment (2)



- VHCC stacks can be placed on the top of VELO (underneath dust cover) and also on the front and rear faces of the LHCb RICH detector

Estimated Acceptance of MoEDAL with TDR & VHCC Stacks



- Acceptances as functions of HIP mass and charge, for electric (left) and magnetic (right) charges, for the MoEDAL detector, assuming a Drell-Yan pair production mechanism with 14 TeV pp collisions (From Ref. **arXiv:1112.2999** [hep-ph]).