Alice ITS HIC production at PLAC (Pixel Lab At CCNU)

Yuzhen Yang

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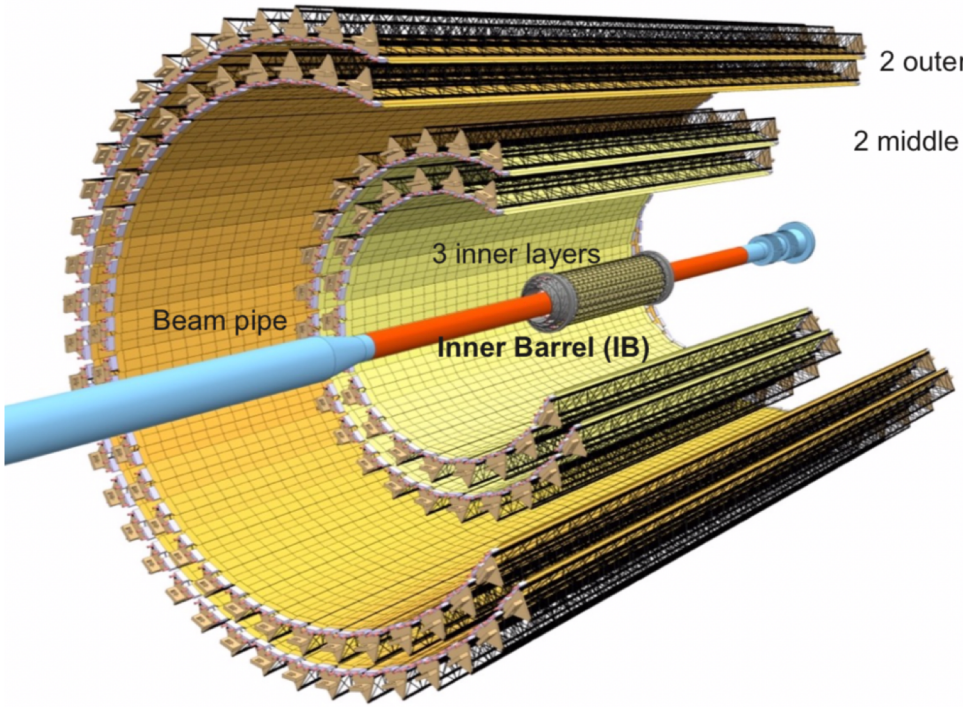
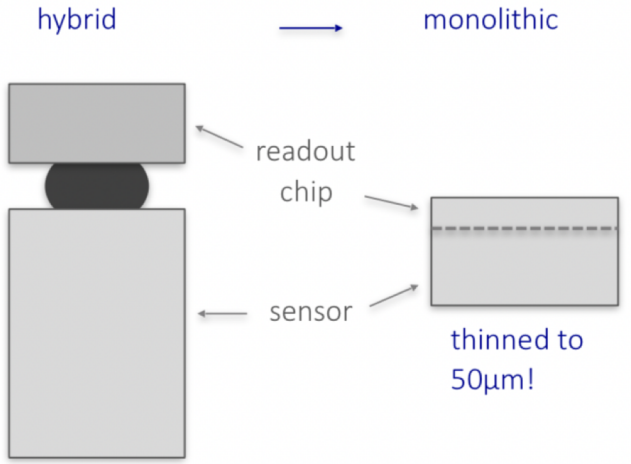
Alice ITS Upgrade



- 7 layers
- 12.5 Gigapixels
- Binary readout
- ~ 10 m^2 active surface

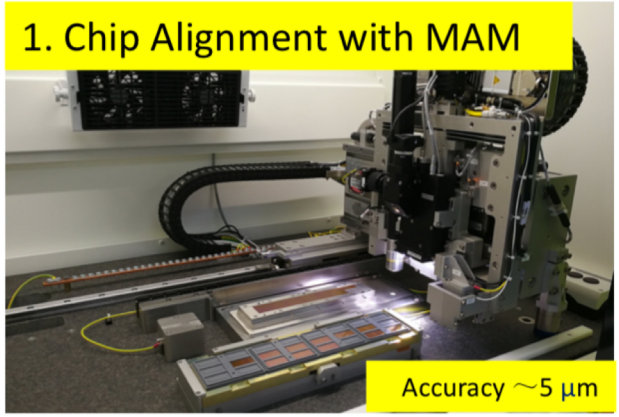
Fully equipped with Monolithic Active Pixel Sensors (MAPS)



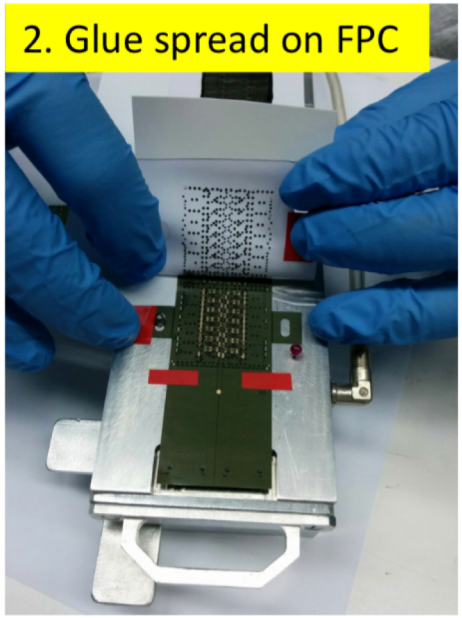
Alice ITS Production

HIC Assembly Procedure

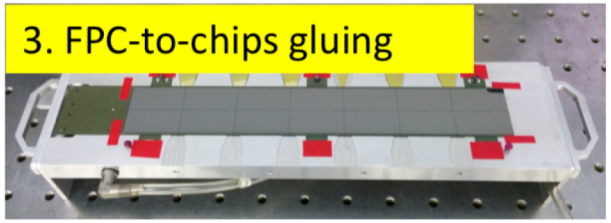
1. Chip Alignment with MAM



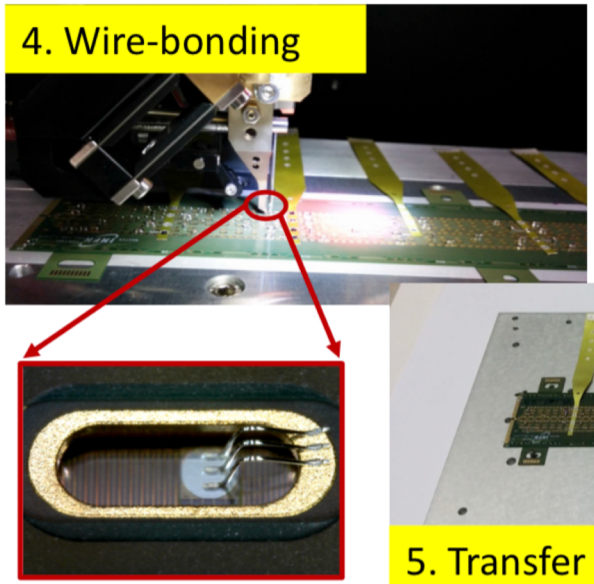
2. Glue spread on FPC



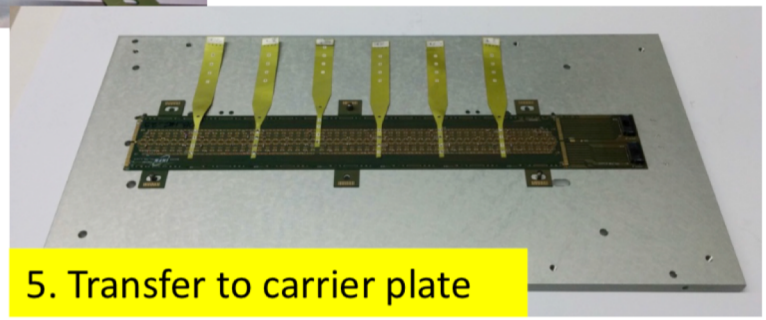
3. FPC-to-chips gluing



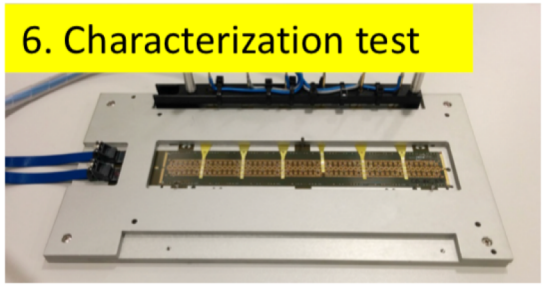
4. Wire-bonding



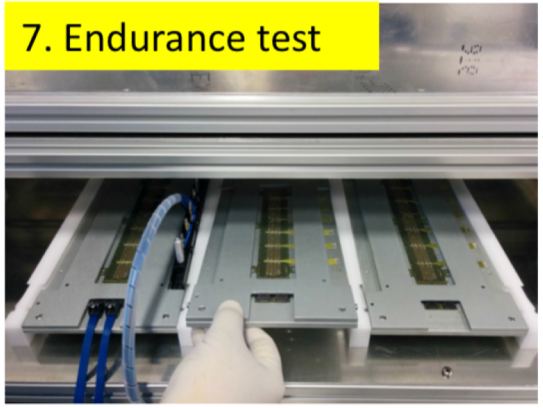
5. Transfer to carrier plate



6. Characterization test



7. Endurance test



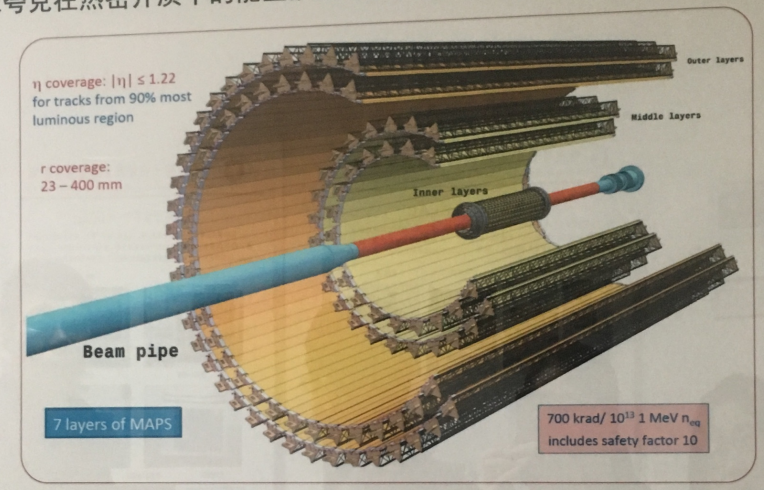
slide: Biao Zhang @4th CLHC 2018

Alice ITS HIC production tips

- Quality Control
  - clean, clean, clean for every steps
  - log: every module process online and paper, time of process, humidity and temperature remote monitor
  - check quality or take pictures for necessary process
- Lab in basement due to less shake
- useful machine:
  - automatic mixed machine
  - package
  - shoe cover machine

ALICE内径迹系统升级项目的研究

ALICE实验将于2016-2019年期间建造一种新的高计数率、高空间分辨本领的硅像素探测器来升级现有的内径迹探测器系统（ITS），共七层（内3层，中间2层，外2层）。通过该项升级，ALICE在顶点重建的空间分辨率、径迹重建效率（尤其是低横动量区间）和读出速度等方面的性能将大幅改善，提高其在重味强子测量等方面的能力，有助于深入理解重味夸克在热密介质中的能量损失机制和部分子热化等方面的物理。



在科技部、教育部和基金委支持下，实验室承担ALICE/ITS升级项目中的硅像素芯片设计、硅像素探测器模块建造以及测试等任务：

- 基于单片有源像素传感器（MAPS）技术的新一代硅像素芯片设计：实验室在芯片设计方面的研究成果已应用于该款芯片中，大幅提高了芯片的读出速度并降低了功耗，并发表论文: *Nucl. Instr. Meth. Phys. Res. A* **785**, 61 (2015)。
- 硅像素探测器模块的高精度自动化集成与测试：实验室通过参加ALICE/ITS硅探测器升级项目，建立起一支具备芯片集成、测试和探测器组装能力的研究队伍，为实验室将来参与国内外大型国际合作实验做好人才和技术储备。

http://QLPL.CCNU.EDU.CN