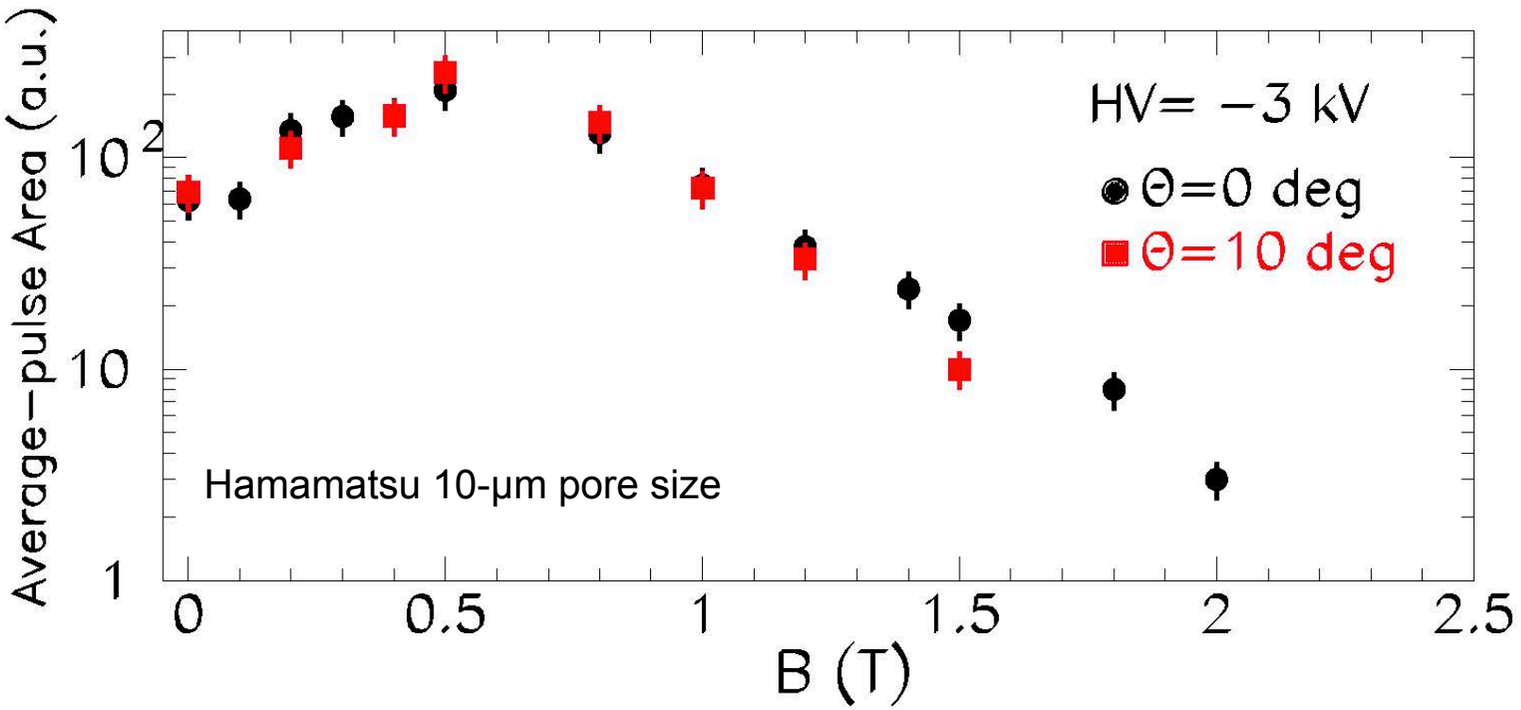
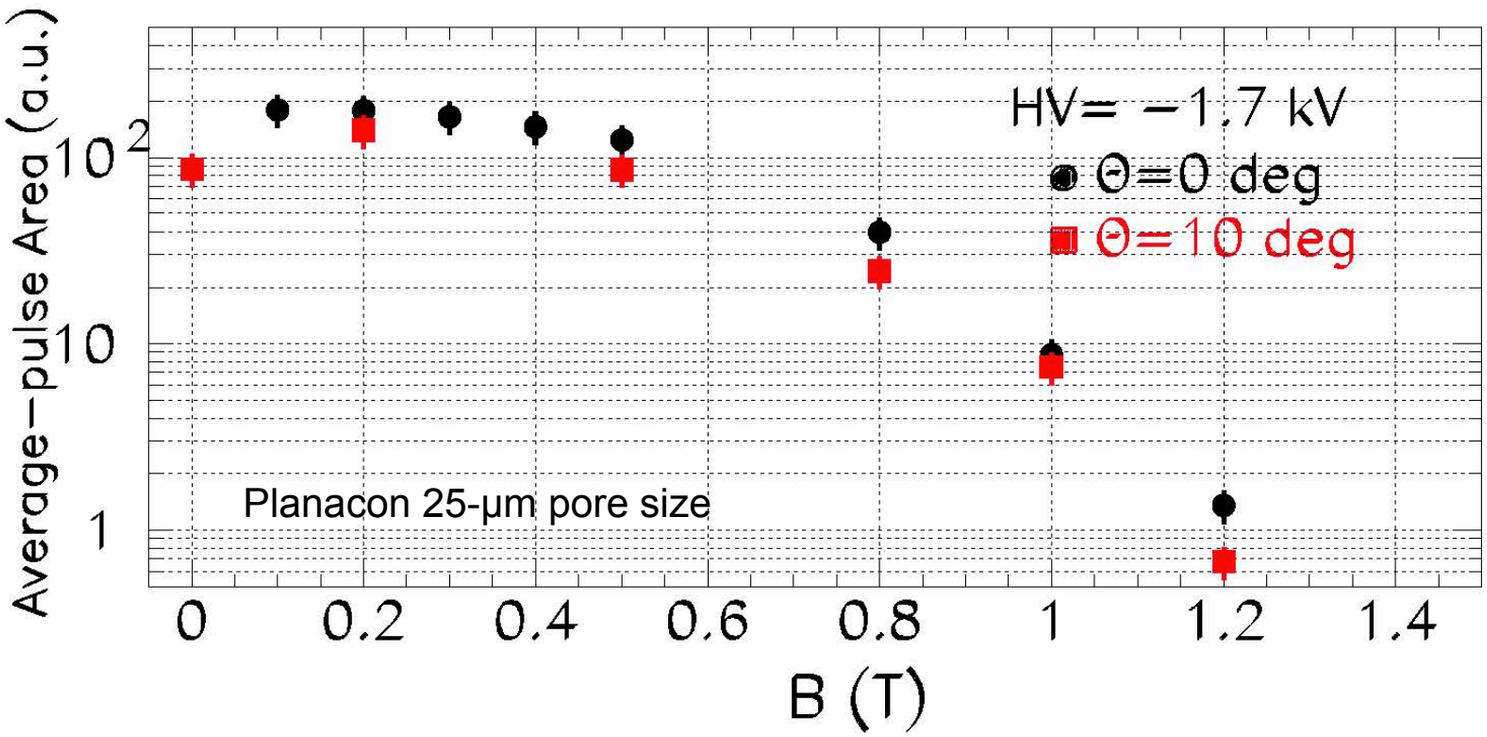
Sensors in High-B Fields

- **Main Goal**:
  - to identify the limitations of current MCP–PMT design and operational parameters for High-B operations;
  - to achieve optimization of these for successful application in DIRC in the high magnetic field of the central detector at EIC.
- **Future Considerations:**
  - to perform evaluations of PMTs procured for detector prototypes.

Sensors in High-B Fields
2016 Results



- Measurements performed at 96% of maximum allowed high voltage.
- 10-μm sensor
  - Can be operated up to about 2 T at standard orientation.
  - Can be operated up to about 1.5 T at larger angles.



- 25-μm sensor
  - At both orientations sensor can be operated up to about 1.2 T
  - Main objective of measurements is to negotiate 10-μm sensor on loan from Photonis.

Sensors in High-B Fields
Planned Activities FY17

- **Effort**:
  - To commission of the universal HV divider that will allow to study gain recovery for different sensors. To obtain final approval from Photonis.
  - MCP–PMT gain measurements of a Planacon 10-μm multi-anode MCP-PMTs as a function of various operational parameters (conditional).
  - Identification the limit of operation of MaPMT H13700 in B-field (support of mRICH efforts) (conditional).
  - Begin development and implementation of a simulation of an MCP–PMT for optimization of design parameters.
  - Laser systems
    - SLAC system: installation and commissioning (conditional).
    - ODU laser: design of an optics box, procurement and manufacturing, commissioning.
  - Assessment and eventual negotiations to merge High-B efforts at JIab and ANL.

Sensors in High-B Fields
Activities in FY18

- Continue with the development of a simulation of an MCP–PMT.
- Perform any measurements that could not have been done in 2017.
- Relocate the Jlab High-B facility (conditional).
- Upgrade and commission
  - Laser systems (anything not finished in FY 2017).
  - Timing capabilities.
- Assess and plan of future upgrades with respect to assessment of MCP-PMTs detector prototypes (primarily DIRC?).