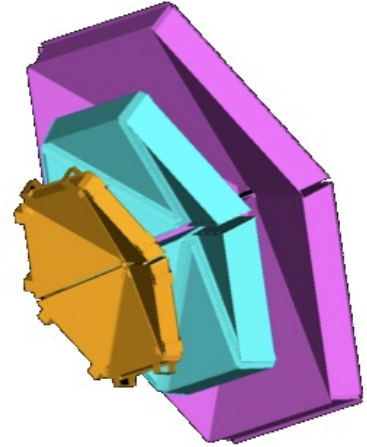


# CLAS12 – Drift Chambers (DC)

The **CLAS12 DC** system will measure the **momentum of charged particles** emerging from the target..

The **DC system** includes 18 wire chambers; each with 2 superlayers of 6 layers by 112 wires. a total of **24,192** sense wires.

Each cell gives a **spatial resolution** of **~250 - 350  $\mu\text{m}$**  to meet the momentum resolution requirements. It has **small cells** and **fast drift velocity** to meet the **luminosity** requirements of  **$10^{35} \text{ cm}^{-2}\text{s}^{-1}$**



## DC – Tracking Specifications

PARAMETER	SPECIFICATION
Angular coverage	5° – 40° (50% $\phi$ -coverage at 5°)
Momentum resolution	$dp/p < 1\%$
$\theta$ Resolution	1 mrad
$\phi$ Resolution	1 mrad/sin $\theta$
Luminosity	$10^{35} \text{ cm}^{-2} \text{ s}^{-1}$

## DC – Design Summary

Cell type	Hexagonal cell
Wire layout	6 sectors, 3 regions, 2 sl's / region
Stereo	+/- 6° stereo
Position	Regions at ~2, 3, 4m. From target
Granularity	112 wires/ layer (24192 total)
Gas Choice	90/10 Argon / CO <sub>2</sub>

- **Construction Strategy and Project Leadership:**

- DC system Group Leader: Mac Mestayer
- Construction responsibilities

JLab (reg.3), ODU (Reg.1), Idaho State (Reg.1)

- Calibration & Simulation
  - Miss. State (K. Adhikari)
  - Idaho State (O.M. Cortes)
  - Juelich (M. Kunkel, D. Lersch, S. Schadmand)

- Calibration underway (see graphs)
- Monitoring scripts written
- Non-linear time-to-distance, time-walk, resolution, intrinsic inefficiency all simulated
- Malfunction-finder project started
- Status tables defined

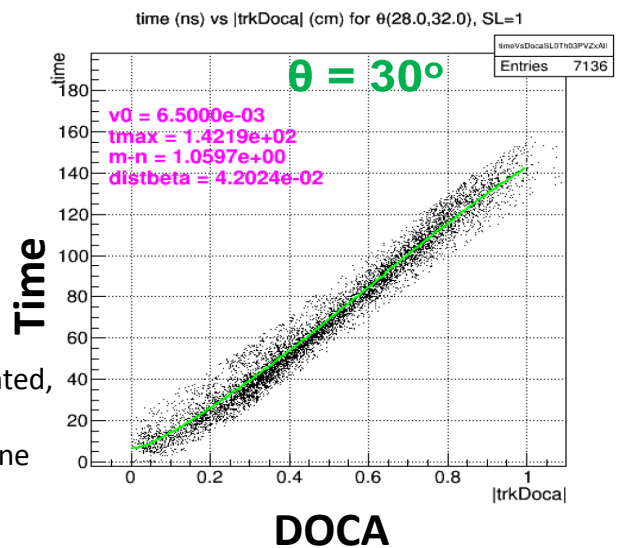
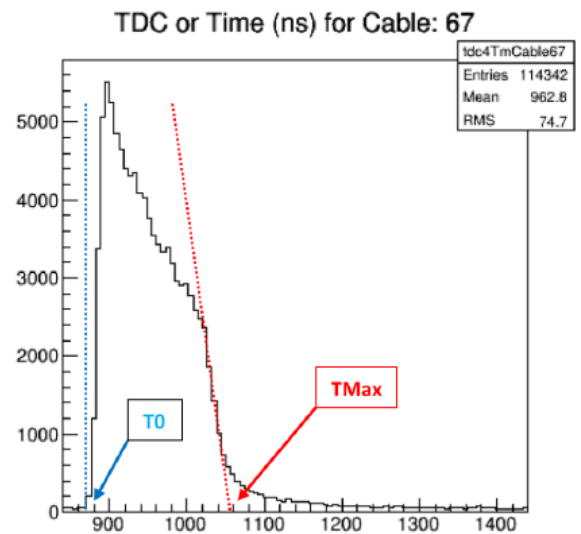
- **Significant Dates:**

- April, 2010: first wires strung in a Region 2 chamber
- March, 2011: 1 chamber complete/ box built at ODU, ISU contract signed
- March, 2012: 6/18 chambers strung
- March, 2013: 14/18 chambers strung; being instrumented, efficiency plateaus established
- October, 2014: all chambers strung; final checkouts done
- Fall 2015: Cosmic tests begun
- **Feb. 2017: KPP run completed**

- **Project Status (March, 2017):**

- All chambers installed, connected, gas flowing
- Time vs. distance calibration well underway
- Monitoring procedures established

### Estimating TMax



Last Updated: March 24, 2017



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