dRICH News

Mechanics:

https://it.overleaf.com/read/rsyjntgpfczq

Alex Eslinger (JLab) is expected to contribute
Initial proposal: cooling and insulation

Aerogel:

Meeting planned with eRD101 and Project (Elke) today

SiPM irradiation:

Ognoing: 3rd 2022 irradiation succesfully done on November 5th

Being extended to protective layers

Peltier cells (in collaboration with LHCb/INFN-GE)

eRD102 Milestones:

Procurement ongoing for SiPM matrices and DAQ for the EIC-driven detector plane
5x 13360 4 x 14160 5x5 cm^2 readout units

Mechanics:

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EIC dRICH Mechanics

November 7, 2022

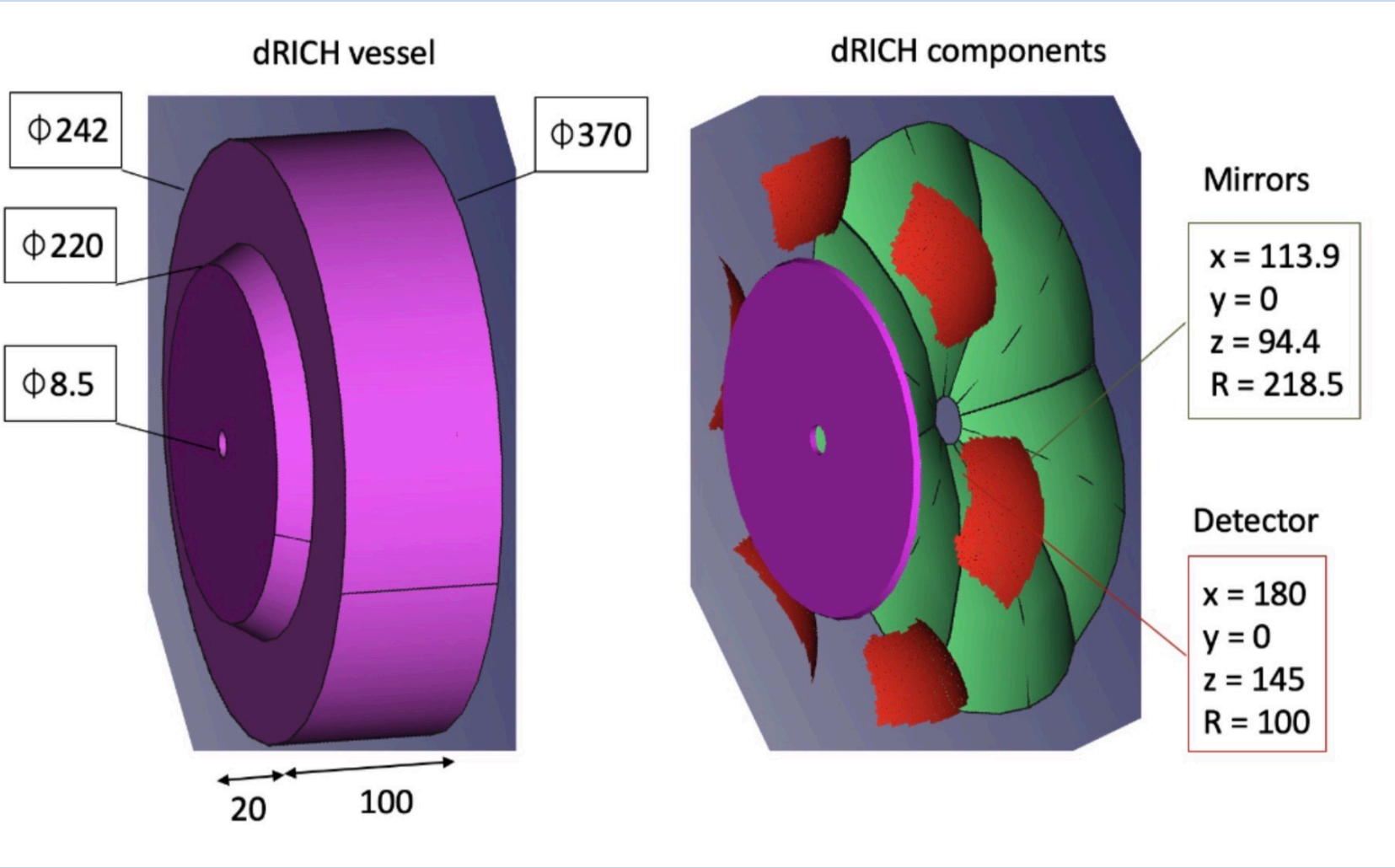
1 Introduction

This document collects the mechanical constraints and alternate solutions for the realization of a dual ring imaging Cherenkov detector in the hadron end-cap of the EIC Detector-1.

2 Working principles

In ring-imaging Cherenkov detectors, the particle momentum range defines the radiator refractive index and, as consequence, type. To cover the high momentum interval at EIC, a gaseous radiator of $n \approx 1.0008$ is required. The consequent limited photon yield imposes an extended radiator volume, of the order of 1 m. Because the intrinsic Cherenkov angle resolution scales as $1/\sqrt{N}$, a shorter length implies a lower limit in momentum coverage. In case of an extended radiator, a mirror array is required to focalize the light on the sensor surface and suppress the uncertainty on the Cherenkov photon emission point. To cover the low momentum interval at ECI, an aerogel radiator of $n \approx 1.02$ is anticipated. The dRICH concept seeks for a cost-effective and compact solution using the two radiators with the same focalization and imaging system.

Baseline dimensions, from EPIC simulation geometry package



Readout Unit