Status of DF and WLS for the VD-Module-0

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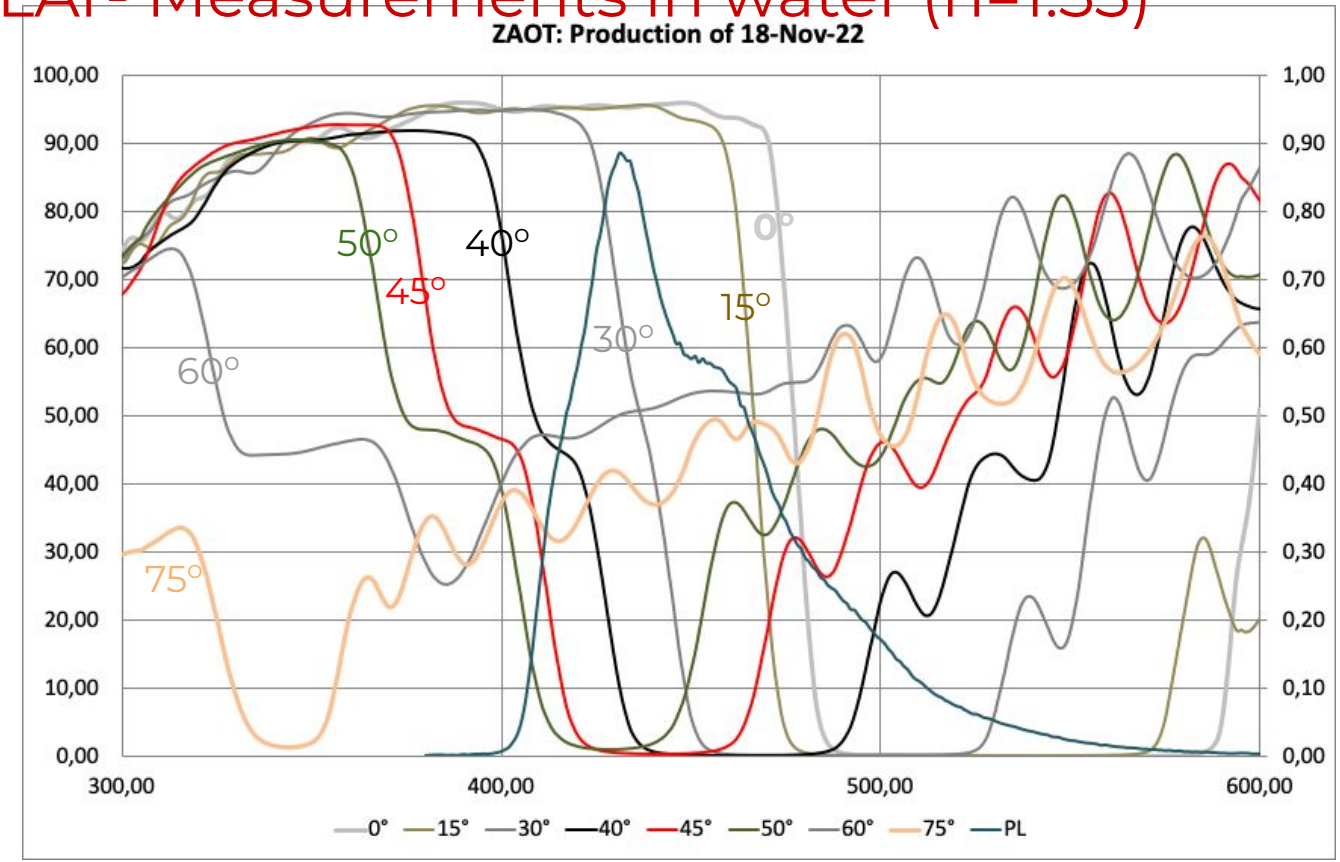
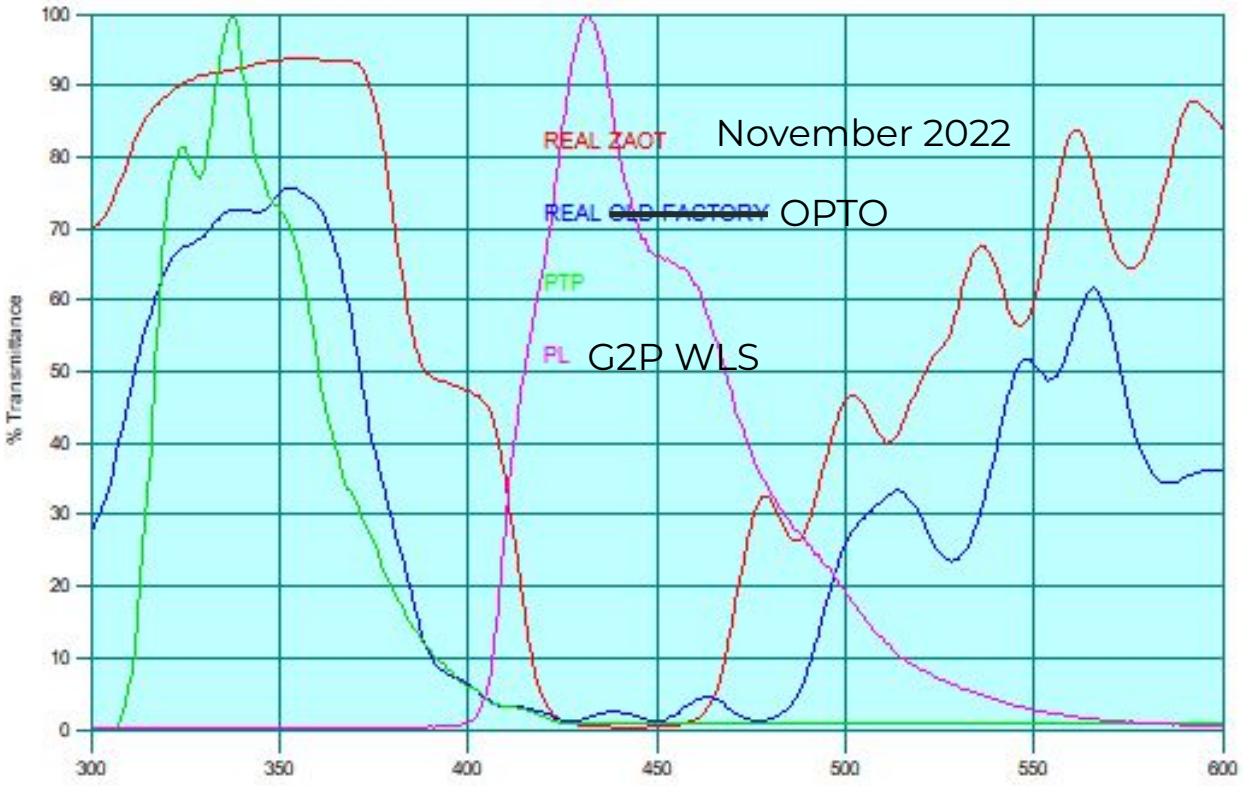
Production 18-Nov-2022 - Designed for operation in LAr- Measurements in water (n=1.33)



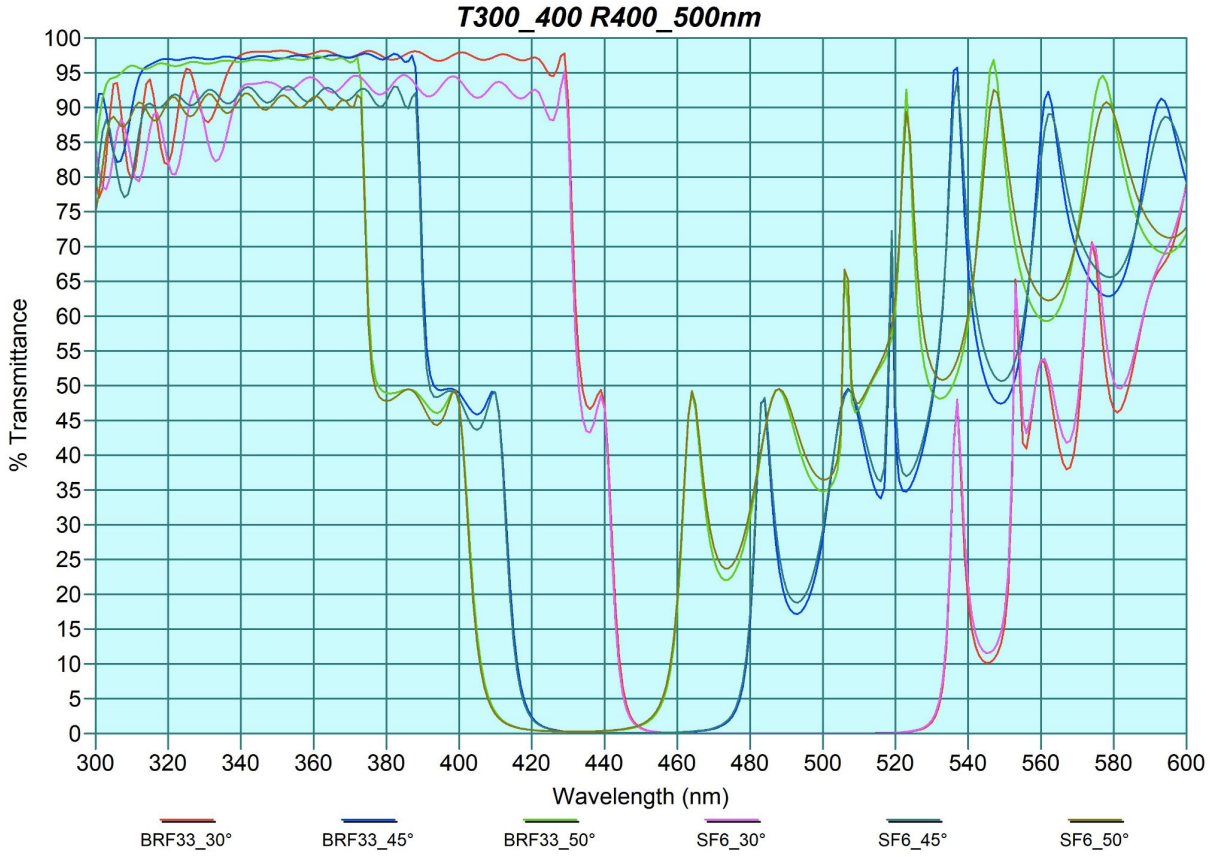
- Designed for AOI= 45° in LAr
- Good “closure” for intermediate AOI: 40°-50°
- Bad closure for AOI>50°
- LAr design→ narrower reflectivity dip → the PL spectrum is barely fully contained

Comparison of ZAOT vs OPTO dichroics coating: AOI=45deg measurements in water



- ZAOT shows better T at 350 nm
- OPTO wider R range

Simulations of Next Production: by 25 january 2023



- Size will be 143.75 x 143.75 mm2
- Designed for AOI= 45° in LAr
- Further improved w.r.t. November 2022
- Good “closure” for intermediate AOI: 30°-50°
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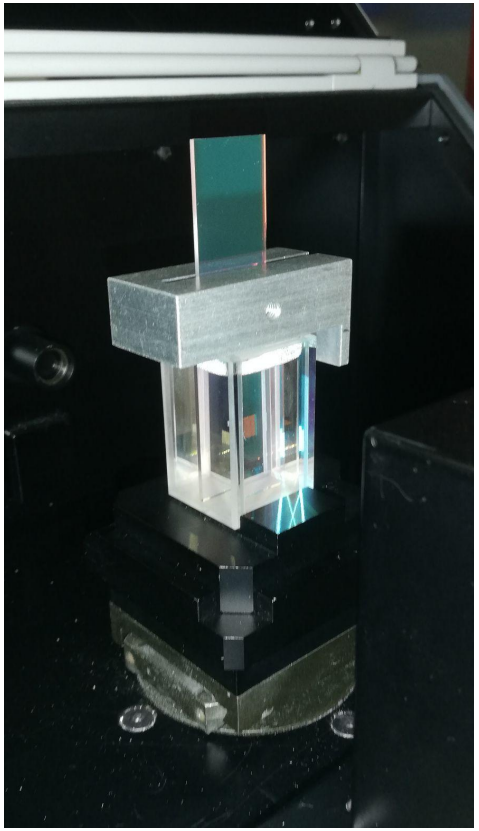
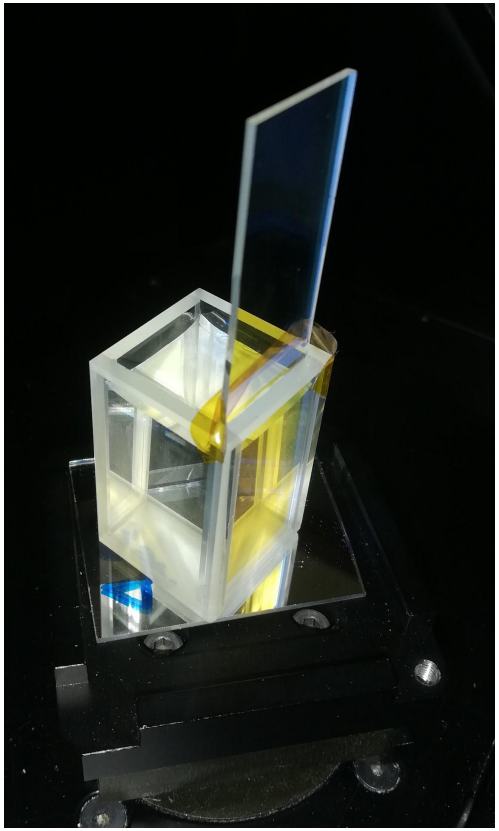
- LAr design→ narrower reflectivity dip → the PL spectrum is barely fully contained

Measurements on ZAOT Dichroics ML coatings

- A slice of dichroic coated glass is located at the center of a 2 cm side vial (optical glass) filled with demi H2O
- The AOI of the glass w.r.t. the beam is changed by mean of a goniometer
- Measurements performed in a spectrofotometer





The structure of a Dichroics filter based on MultiLayer structures

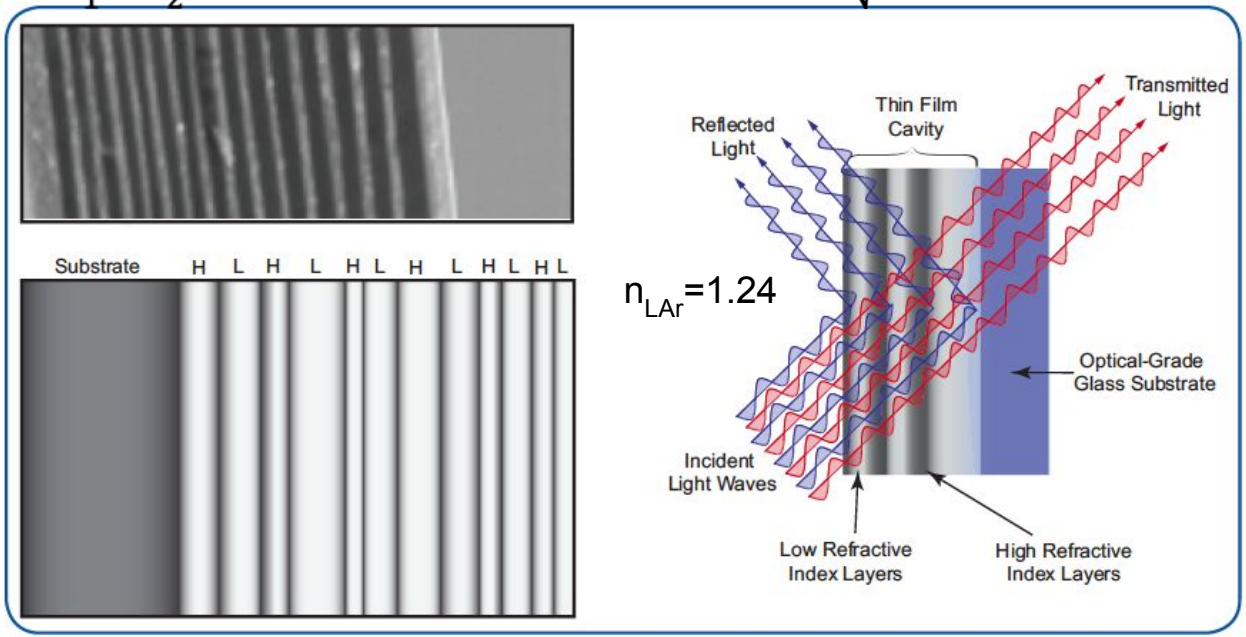
- $Reflectivity: \varrho^2 = \left|\frac{n_1 - n_2}{n_1 + n_2}\right|^2$

Dichroic ML operate as a Fabry-Perot interferometer

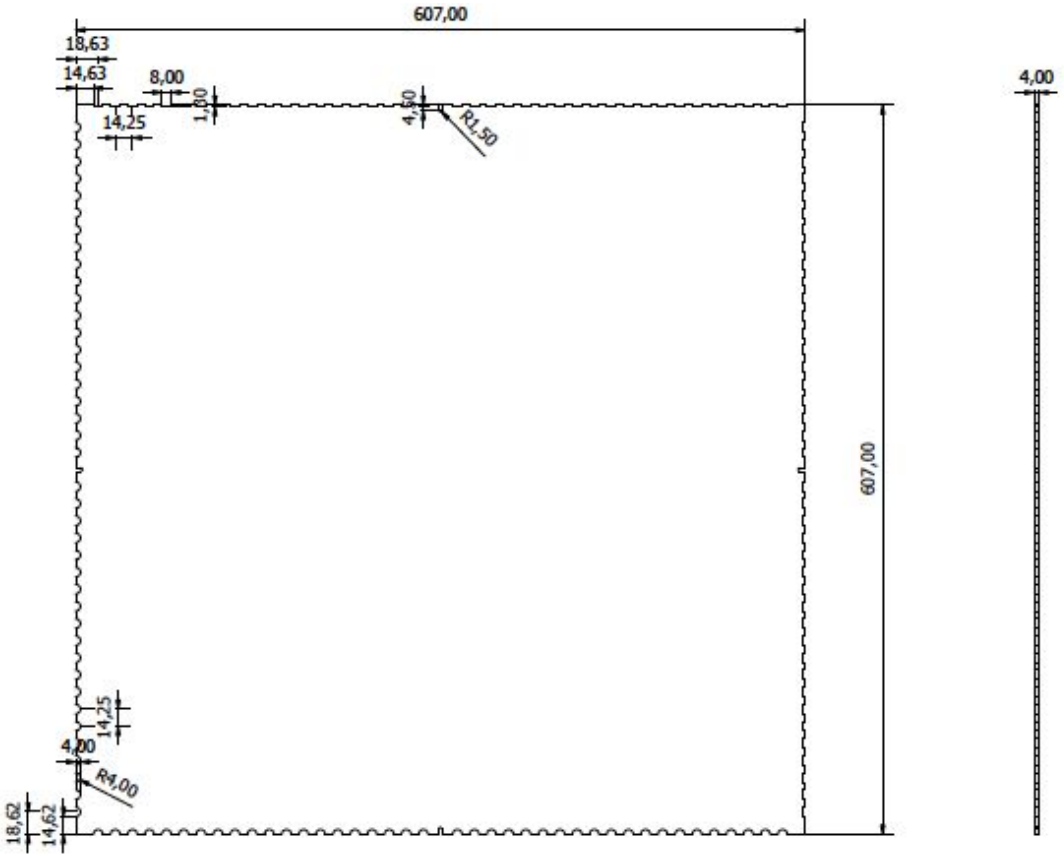
- $Cutoff\ dependency\ from\ refraction\ index$

n1= LAr/air
n2=dichroic

$$\lambda = \lambda_0 \sqrt{1 - \frac{n_1^2}{n_2^2}\sin^2\theta}$$



WLS



- 3 x (607 x 607 x 4) mm3 with slots for the centering pins & flat edges will travel from INFN-MiB to CERN Prevessin on 22nd January 2023
- 14 (607 x 607 x 4 mm) with flat & cylindrical dimples will be shipped from G2P to CERN on the 25th january 2023