Linear Variable Dichroic – Dependence on spot-size and AOI

The purpose of this document is to illustrate how the spectral performance of the linear variable dichroic described by FTLi750c.fsy depend on the width of the light spot and angular distribution of the light incident on the dichroic.

The dichroic is 60mm long, with a coated area with a length of 58.1mm. The edge is positioned at 300nm at one end of the dichroic and at 750nm at the other end of it. In the following the light spot is assumed to be defined by a rectangular slit 10mms high and centered at 60% of the full length.

Dependence on the width of the light-spot

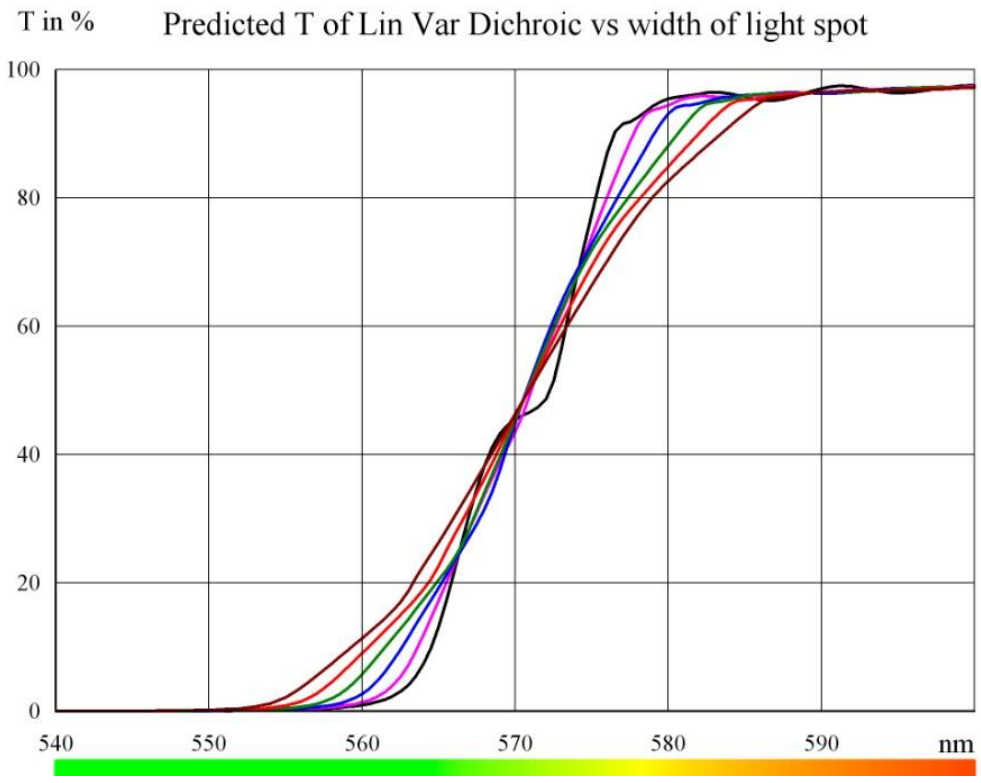


Figure 1 Predicted transmission of unpolarised and parallel light at AOI = 45 Degrees.

Black curve: Width = 0.5mm, Violet curve: Width = 1.0mm, Blue curve: Width = 1.5mm, Green curve: Width = 2.0mm, Red curve: Width = 2.5mm, Brown curve: Width = 3.0mm

The steepness of the edge decreases somewhat with increasing width of the light spot. Depending on the actual application, it may be acceptable to work with a width of a couple of mm or more.

Dependence on the angle of incidence, AOI

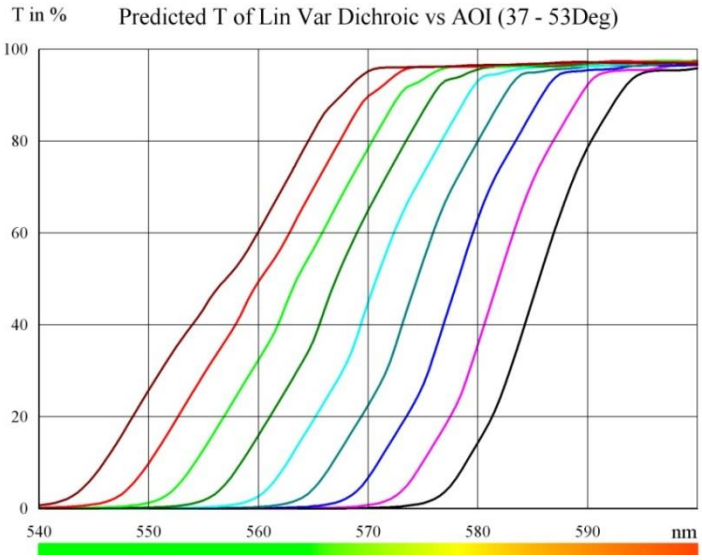


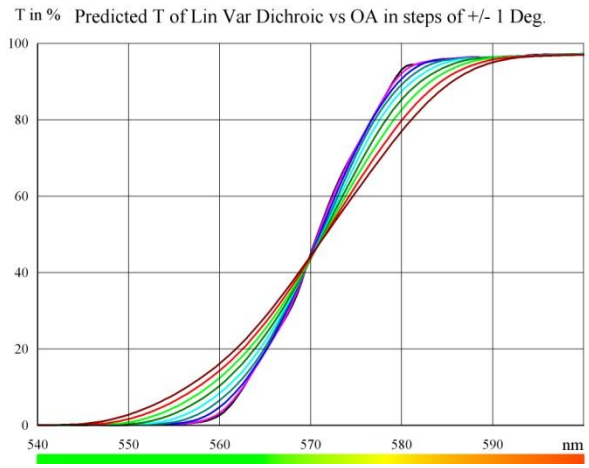
Figure 2

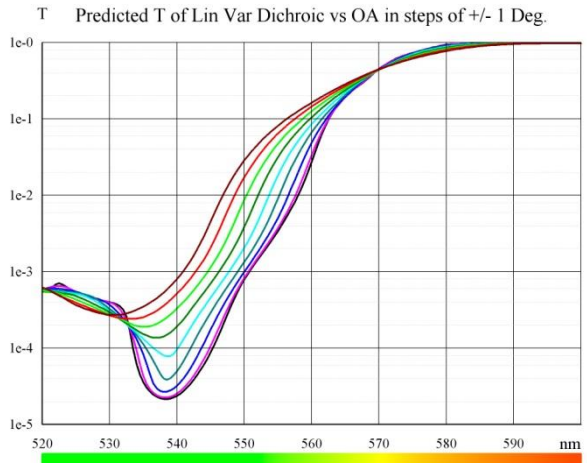
Transmission curve shifts towards shorter wavelength as AOI increases. However the shape of the edge is quite stable in the angular range investigated.

AOI gradually increases from 45 – 8 Deg. = 37 Degrees to 45 + 8 Deg. = 53 Degrees in steps of 2 Degrees.

Width of the light spot is kept constant at 1.5mm and the light is assumed to be unpolarised.

Dependence on the opening angle, OA





Figures 3a and 3b Assuming an even angular energy distribution, in a non-parallel light bundle with an opening angle of OA Degrees – the averaged transmission is predicted to be as shown. Opening angle (half cone angle) is increasing from 0 Degrees to 8 Degrees in steps of 1 Degree. Steepness of the resulting edge decreases gradually with increasing OA.