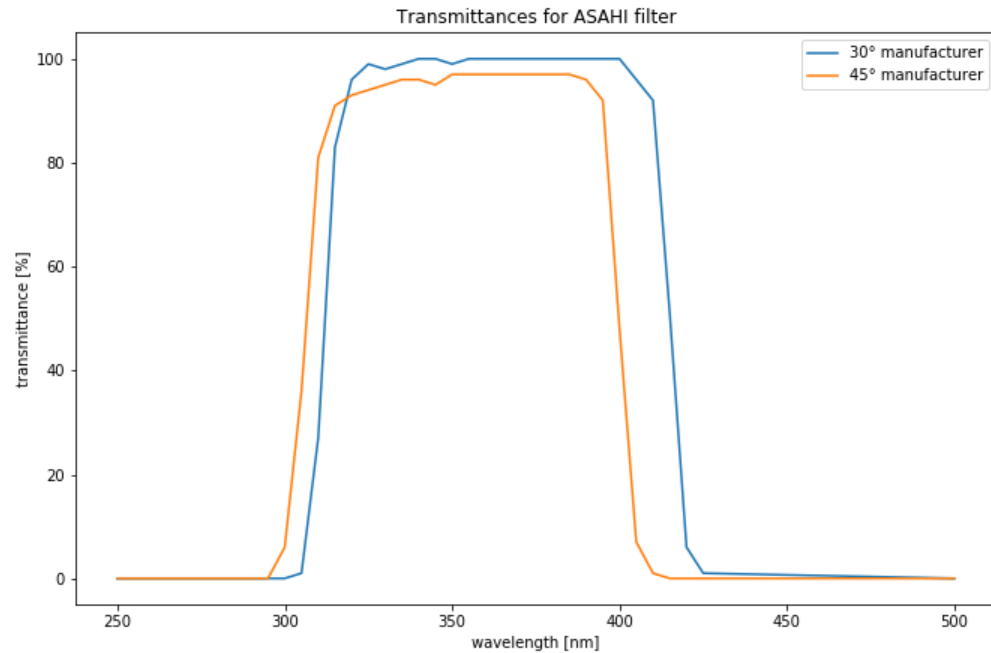


Dichroic filter

Simulation of dichroic surfaces in GEANT4

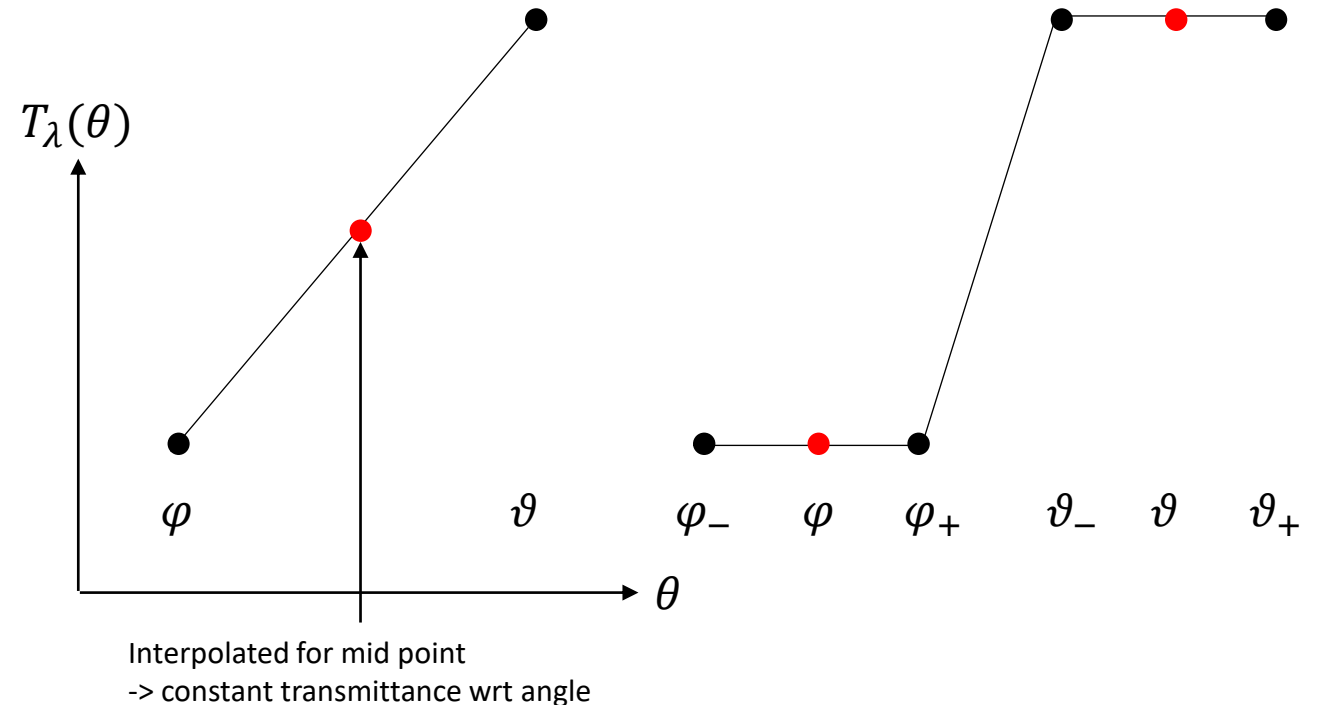
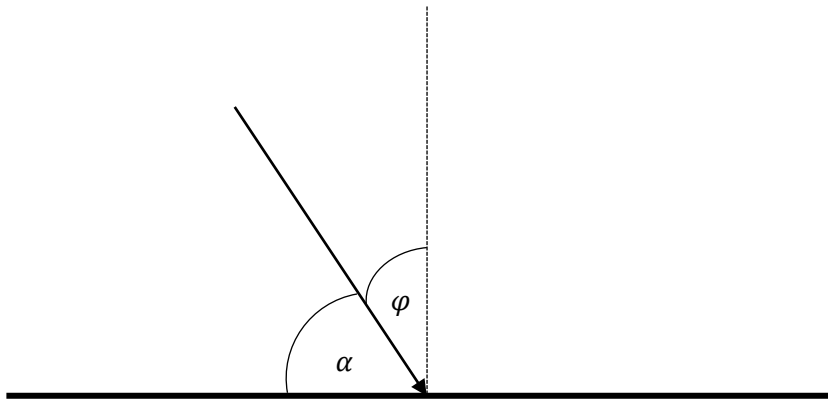
Example of dichroic filter: model from ASAHI

- Transmittances known for 30° and 45°
- Aim: Simulate this behaviour in GEANT4, later implement dichroic filter into homemade ARAPUCA simulation



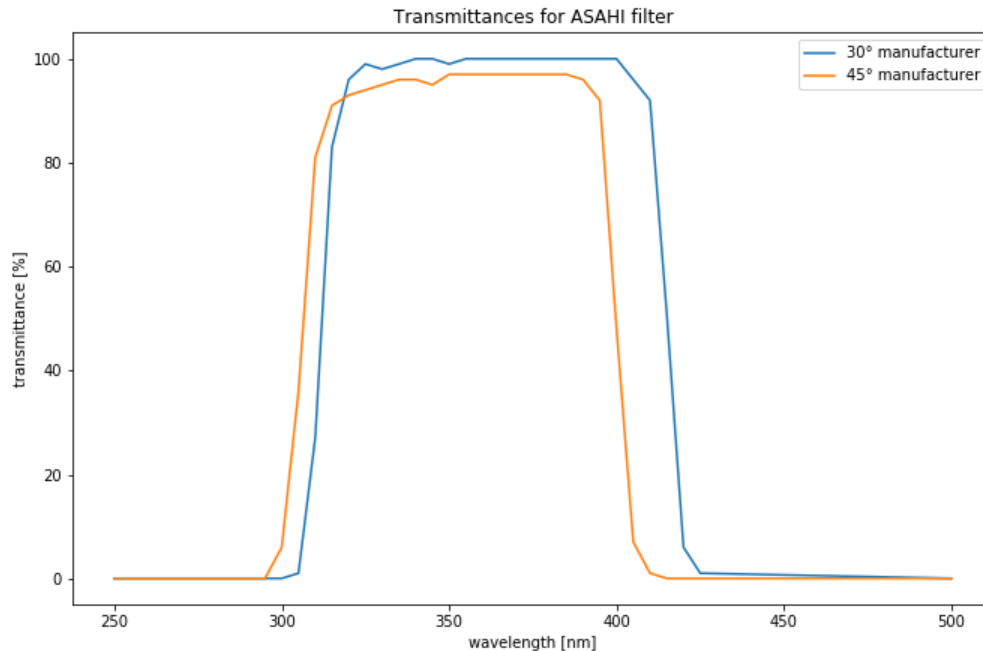
Dichroic filter in GEANT4

- Transmittances need to be defined as values related to both an angle of incidence and wavelength of the incoming photon
- For simplicity purposes, photon initial energies were defined exactly in accordance with the given parameters for the dichroic filter:
 - Wavelengths: [250, 295, 300, 305, ..., 425, 500] (29 entries)
- In order to account for interpolation of transmittance values, introduce for incident angles 45° and 60° neighbouring angles with same transmittance when wavelength fixed:
 - Angles: [43, **45**, 47, 58, **60**, 62]
 - **Note:** Angles were previously set to 30° and 45° due to selection of angle complementary to incident one (α)



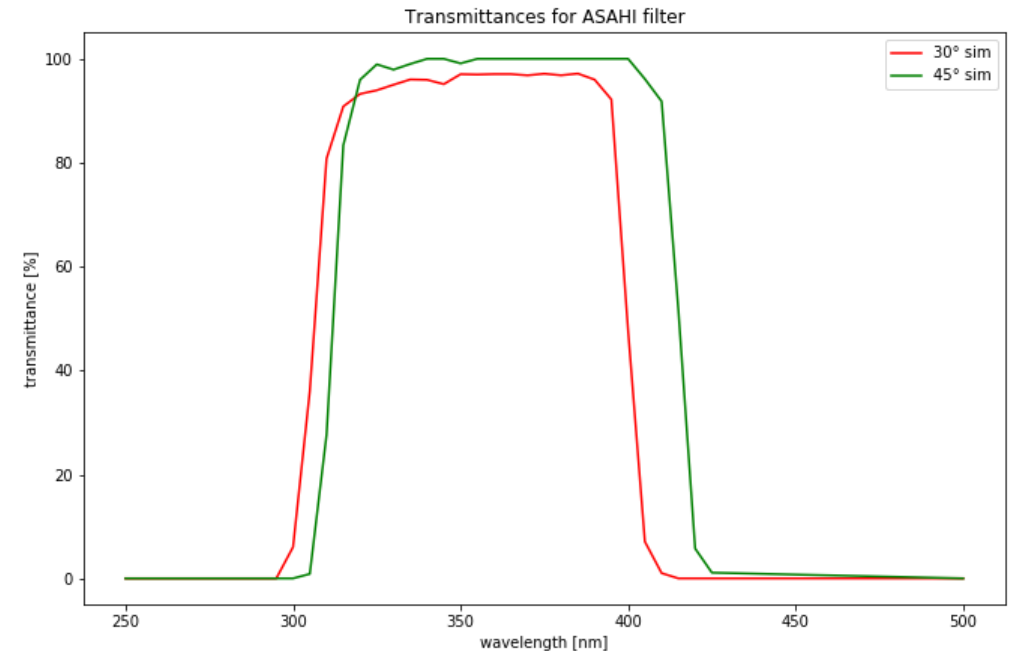
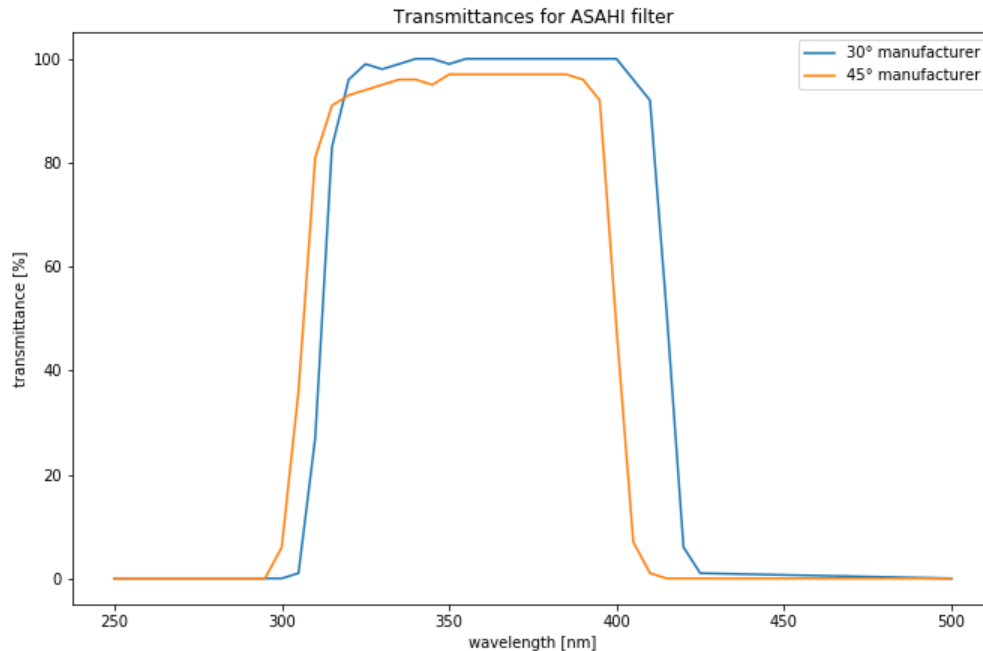
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Next Steps

- Take measurements in lab
- Acquire information about material properties per slab
 - Material type
 - Thickness
- Test further methods for simulation: The python package TMM (Transfer matrix method)