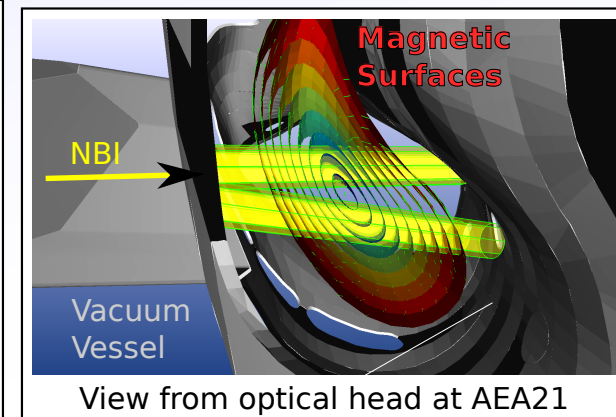
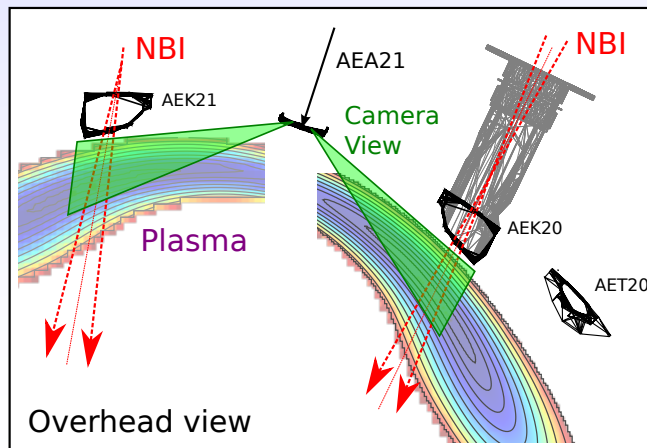


# MSE possibilities for W7X

For OP2, we will need to measure the profile of the < 50kA bootstrap current.

The MSE will view one or both beams from the AEA21 port between the two beams ducts.

The full polarised image will be relayed to outside the vessel.



MSE is difficult in stellarators because pitch angle and Doppler shift vary across the beam width, making a very complex polarised spectrum.

For W7X, measured polarisation  $\theta$  varies due to geometry by  $3.0^\circ$  but we need to measure  $\Delta\theta \sim 0.1^\circ$  to see 10kA in the current profile.

So normal MSE polarimeter as on Tokamaks *cannot* work. Options are:

1) Spectrometry + Polarimetry (as LHD)  
and / or

+ Lots of information  
(Easier to isolate problems)

- Low light levels

2) Imaging MSE (insensitive to the spectrum)

+ Lots of light (Whole spectrum)  
+ 2D view

- Provides only average angle  
- Still being developed

Modelled reconstruction of W7X current profiles using IMSE:

(Assuming it's as accurate as it is now at ASDEX Upgrade)

