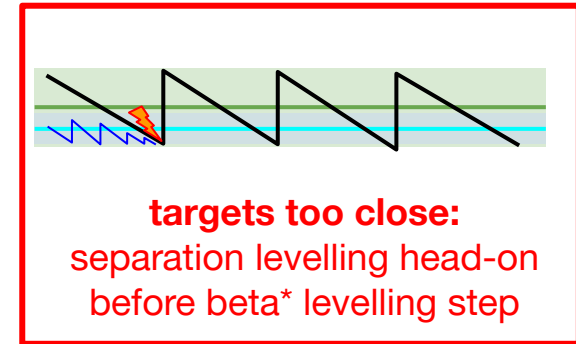
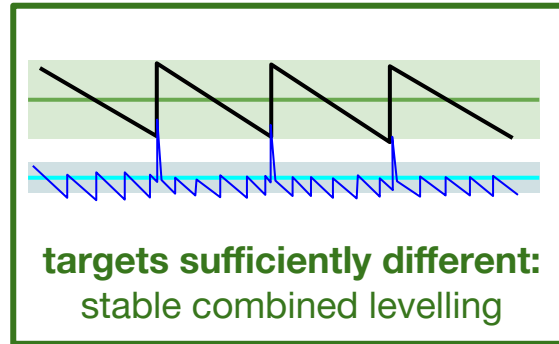
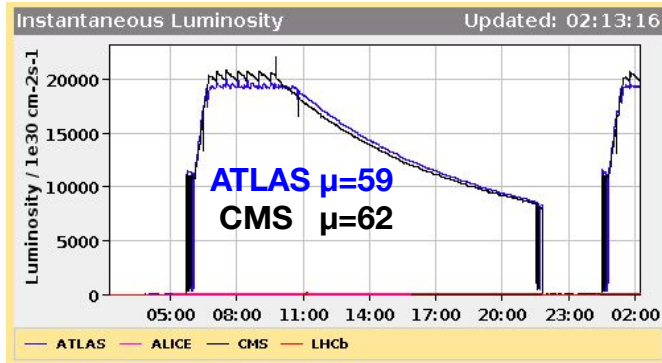


luminosity fine-tuning by crossing angle after TS1

M. Hostettler, P. Moortgat, J. Wenninger

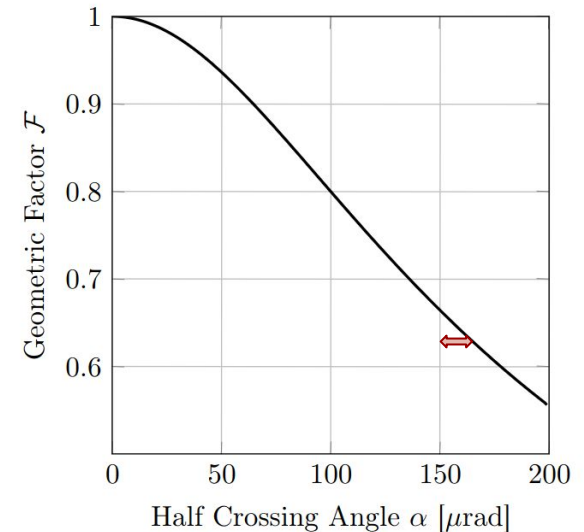
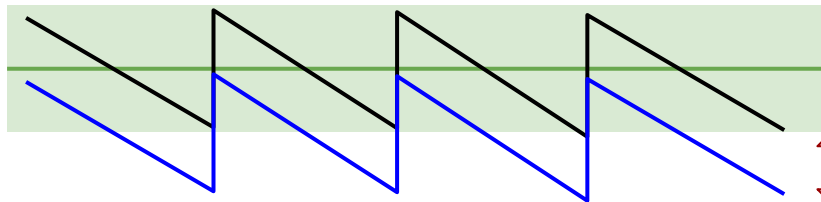
luminosity fine-tuning: experiment request

- ATLAS and CMS are running very close to their pile-up limit
- with beta* levelling, luminosity & pile-up for IP1 & 5 are linked
- ATLAS & CMS request to **level to different targets**
 - if difference > ~5%: combined separation + beta* levelling
 - not stable for smaller differences: separation not effective when too close to head-on, risk to go over the head-on position before stepping in beta*

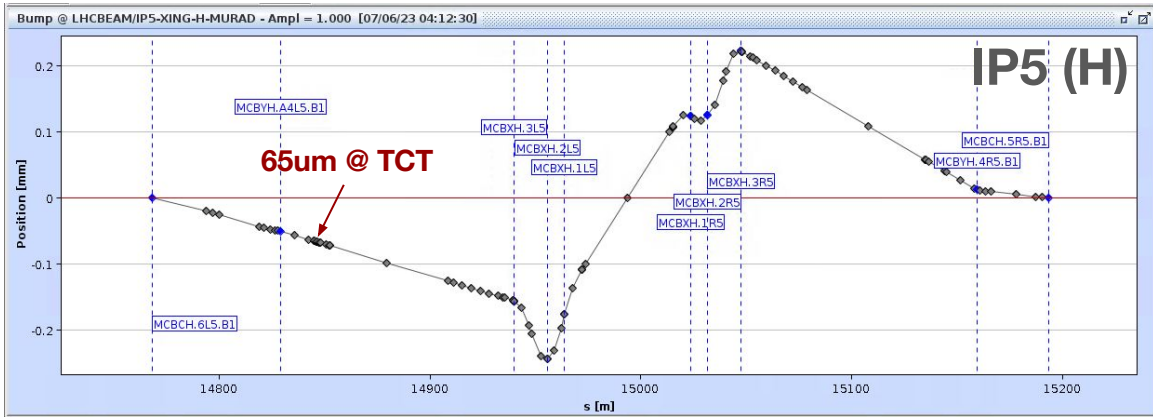
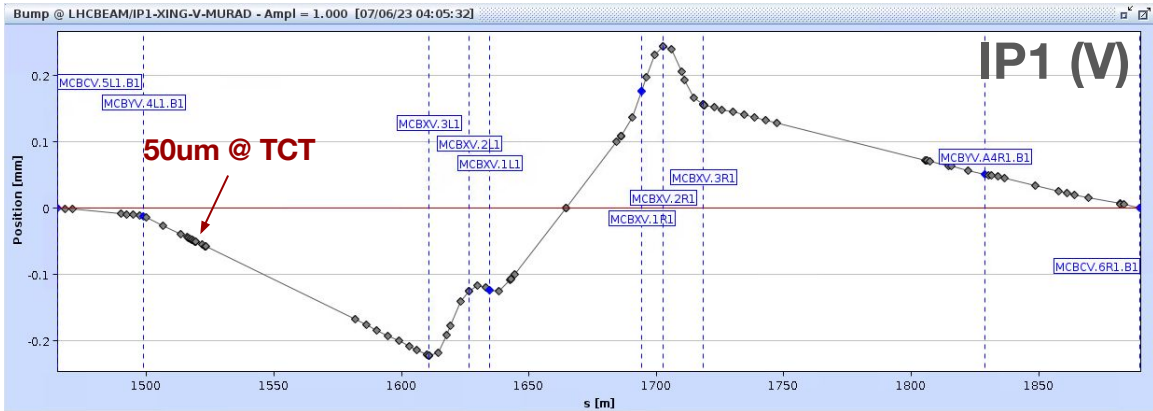


tuning luminosity by crossing angle

- 10 urad half crossing angle difference: ~5% luminosity
- **proposal: allow ± 5 urad crossing angle tuning**
 - minimize magnitude of changes by using both IPs
- cover the "blind spot" of separation levelling
- no regulation: constant offset over the fill

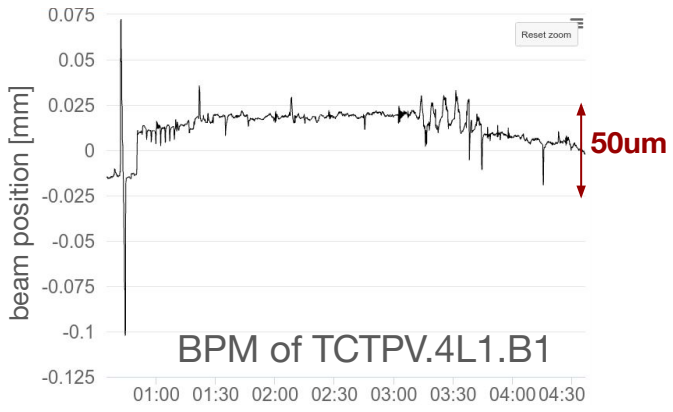


orbit impact



5 urad crossing angle :

- 50-65um @ TCT
- ~0.1 sigma
- less than an emittance scan at 1.2m



conclusions

- **ATLAS and CMS ask for different pile-up/luminosity targets**
 - targets intrinsically coupled in beta* levelling
 - differences > 5%: parallel separation levelling
 - differences < 5%: "blind spot"

- **proposal: allow ± 5 urad crossing angle tuning in IP 1 & 5**
 - 10 urad difference = ~5% luminosity
 - covers the "blind spot"
 - orbit effect @ TCT: 50um / 65um
 - in the shadow of reproducibility
 - less than an emittance scan at 1.2m