Review of RP-related scoring plane positions

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For a ??? meeting
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- scoring plane here = a plane perpendicular to an LHC beam, associated with a RP

- various scoring plane definitions/use cases
  - *"geometry – centre"*: centre of the RP (*z* wise) as stored in CMSSW geometry
    - as printed by CTPPSGeometryInfo module
    - stored in: CTPPSGeometry::rps_map_[idx]>second->translation().z()
  - *" local tracks"* (reco): where local track position/intercept evaluated
  - *"optics CMSSW"*:
    - where transported proton (from IP to RP) placed – matters for simu
    - e.g. defined in Validation/CTPPS/python/simu_config/year_2021_cff.py (and later uploaded to DB)
  - *"optics MADX"*
    - where MADX evaluates optical functions (which we later use in CMSSW)

- what matters
  - "optics CMSSW" is correctly placed *relatively* wrt. CMSSW geometry → correct interpolation between the optics scoring plane and individual sensor planes
  - optical functions are evaluated at the right place

- what does NOT matter (strictly speaking)
  - absolute comparison between MADX and CMSSW z positions (but still good to keep them synchronised)
    - all "communication" between IP and RPs goes through the optical functions

- investigation done with CMSSW_12_1_0_pre1, all values in metres and "TOTEM" convention
  - "local tracks" evaluated always (strips and pixels) at "geometry – centre"
  - other values (MADX values extracted from TFS files kindly provided by Mario):

	RP	RP description	gemetry - centre local tracks	optics MADX	optics CMSSW current	optics CMSSW proposal
2016 setup						
	3	far strip	-212.550	-212.551	-212.551	*-212.550*
	2	near strip	-203.827	-203.826	-203.826	*-203.827*
	102	near strip	203.827	203.826	203.826	*203.827*
	103	far strip	212.550	212.551	212.551	*212.550*
2017 setup						
	23	far pixel	-219.550	-219.551	-219.550	-219.550
	3	near strip	-212.550	-212.551	-212.551	*-212.550*
	103	near strip	212.550	212.551	212.551	*212.550*
	123	far pixel	219.550	219.551	219.550	219.550
2021 setup						
	23	far pixel	-219.550	-219.551	-219.550	-219.550
	16	1st diamond	-215.700	-215.710	-215.700	-215.700
	22	2nd diamond	-215.078	-215.077	-215.078	-215.078
	3	near pixel	-212.550	-212.551	-212.551	*-212.550*
	103	near pixel	212.550	212.551	212.551	*212.550*
	122	2nd diamond	215.078	215.077	215.078	215.078
	116	1st diamond	215.700	215.710	215.700	215.700
	123	far pixel	219.550	219.551	219.550	219.550

  - typically very small difference (1 mm) → *proposal* (rhs column) to align "optics CMSSW" with "geometry – centre" → this is what matters
  - only for the original timing RPs there is a 1 cm difference between MADX and CMSSW (red cells) – doesn't matter much