

Comparison of the codes SAD, MAD and PLACET on the tracking for the CLIC FFS

28th January 2005

1 Luminosities by SAD, MAD and PLACET

	$\mathcal{L} [10^{34} \text{ m}^{-2} \text{ s}^{-1}]$	$\mathcal{L} [10^{34} \text{ m}^{-2} \text{ s}^{-1}]$
Codes	w/o SR	w SR
SAD	6.30639	4.16662
PLACET	6.28974	4.59272
MAD	6.0665	4.52006
MAD*		5.59116

* With scaling of the energy after every bending magnet.

2 IP multiple particle tracking

2.1 Coordinates comparison

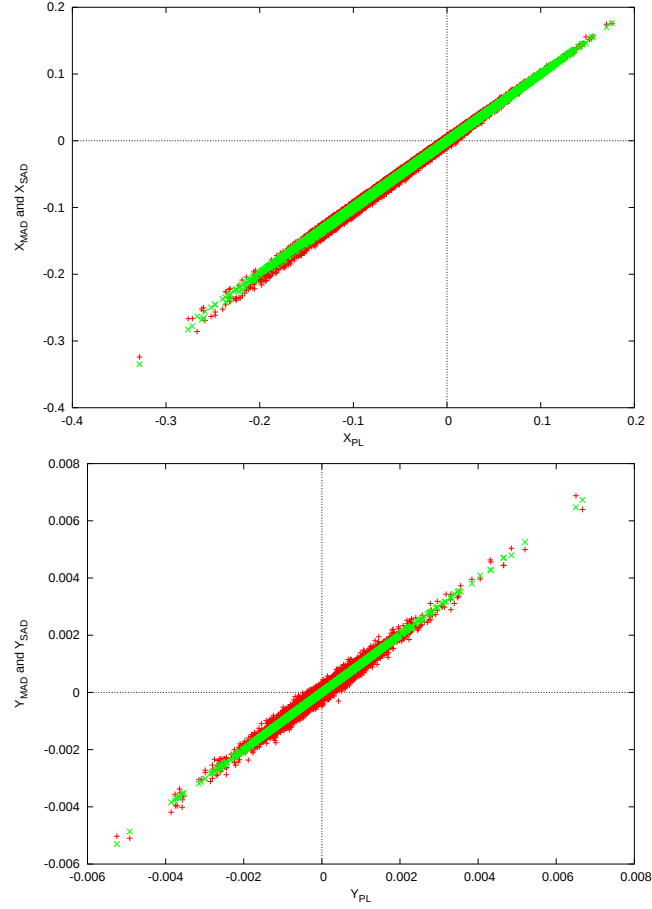


Figure on the top: red x_{MAD} versus x_{PLACET} , green x_{SAD} versus x_{PLACET} ;
on the bottom: red y_{MAD} versus y_{PLACET} , green y_{SAD} versus y_{PLACET}

2.2 X position comparison. Energy dependence

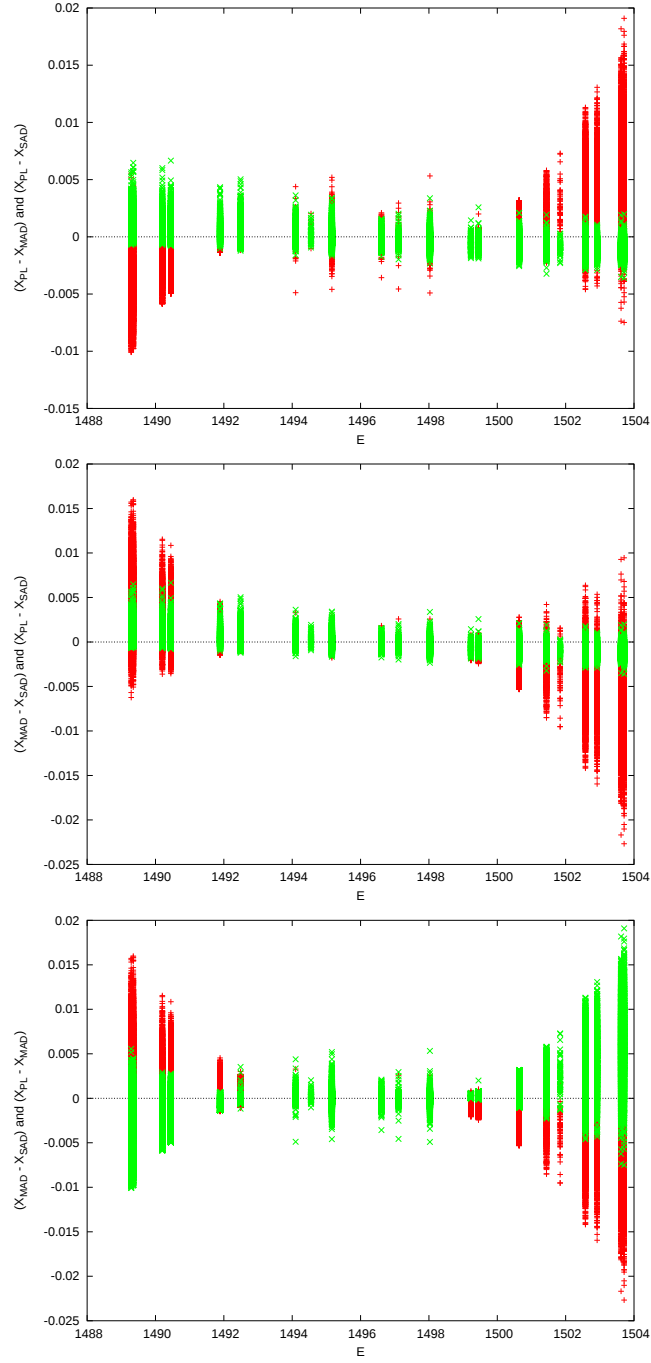


Figure on top: red $(x_{PLACET} - x_{MAD})$, green $(x_{PLACET} - x_{SAD})$; on the center: red $(x_{MAD} - x_{SAD})$, green $(x_{PLACET} - x_{SAD})$; on the bottom: red

$(x_{\text{MAD}} - x_{\text{SAD}})$, green $(x_{\text{PLACET}} - x_{\text{MAD}})$. The units are μ m on the vertical axis and GeV for the E. It is observed a clear dependence on energy of $x_{\text{PLACET}} - x_{\text{MAD}}$ and $x_{\text{MAD}} - x_{\text{SAD}}$. The difference $x_{\text{PLACET}} - x_{\text{SAD}}$ is uniform on all the range the energies.

2.3 Y position comparison. Energy dependence

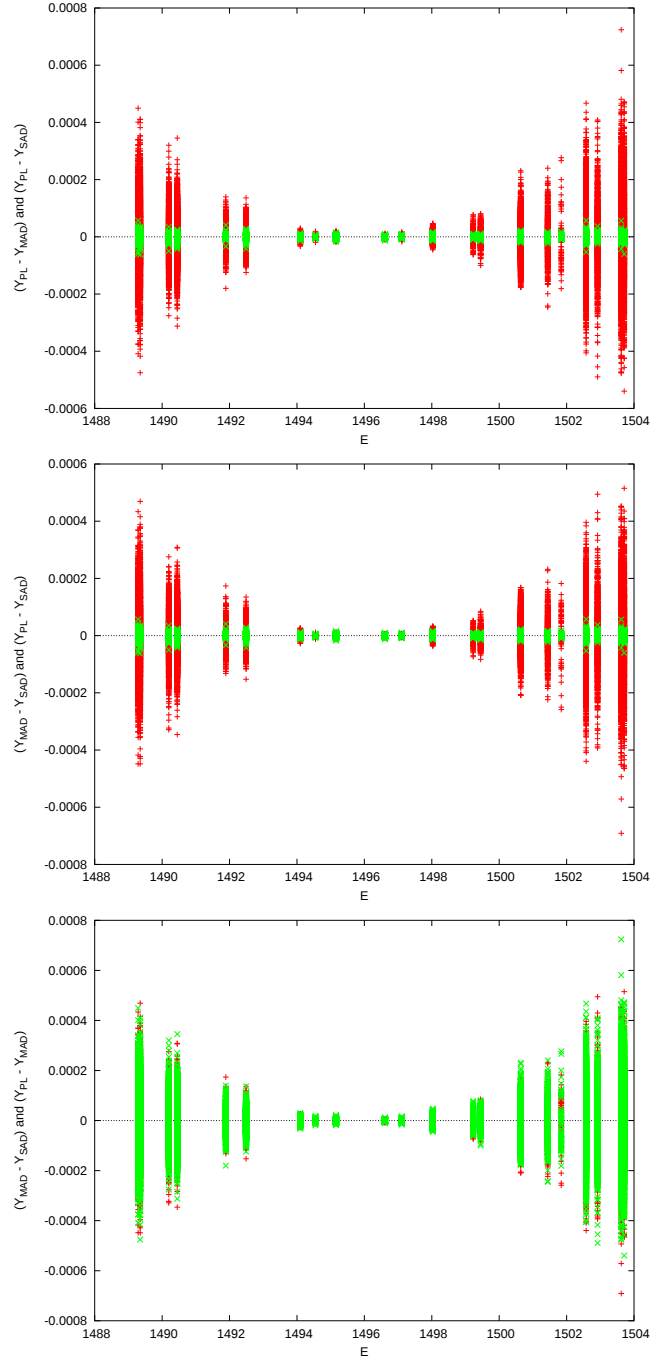


Figure on top: red $(y_{\text{PLACET}} - y_{\text{MAD}})$, green $(y_{\text{PLACET}} - y_{\text{SAD}})$; on the center: red $(y_{\text{MAD}} - y_{\text{SAD}})$, green $(y_{\text{PLACET}} - y_{\text{SAD}})$; on the bottom:

red ($y_{\text{MAD}} - y_{\text{SAD}}$), green ($y_{\text{PLACET}} - y_{\text{MAD}}$). The units are $\mu\text{ m}$ on the vertical axi and GeV for the E. It is obseved a clear dependence on energy of $y_{\text{PLACET}} - y_{\text{MAD}}$ and $y_{\text{MAD}} - y_{\text{SAD}}$. The difference $y_{\text{PLACET}} - y_{\text{SAD}}$ is uniform on all the range the energies.

2.4 Beam sizes at the IP depending on the energy spread

