

Benchmark of SAD, Bmad and PTC for sler_1689

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Study memo

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Tasks of benchmark work

- Parameters at IP
- Twiss functions
- Summary

1. Parameters at IP with $\delta=0$.

Bmad:

$\beta_x=0.031935787\text{m}$, $\alpha_x=0.5912462\text{E-}3$, $v_x=44.530088$,

$D_x=0.20343695\text{E-}6\text{m}$, $D'_x=0.16998011\text{E-}4$,

$\beta_y=2.6352853\text{E-}4\text{m}$, $\alpha_y=-0.3626459\text{E-}3$, $v_y=46.56811$,

$D_y=-0.14648086\text{E-}7\text{m}$, $D'_y=0.20250707\text{E-}4$,

SAD:

$\beta_x=0.032\text{m}$, $\alpha_x=-4.05\text{E-}11$, $v_x=44.53$,

$D_x=-2.08\text{E-}13\text{m}$, $D'_x=-1.84\text{E-}12$,

$\beta_y=2.7\text{E-}4\text{m}$, $\alpha_y=-2.22\text{E-}11$, $v_y=46.57$,

$D_y=1.856\text{E-}14\text{m}$, $D'_y=-8.34\text{E-}12$,

PTC:

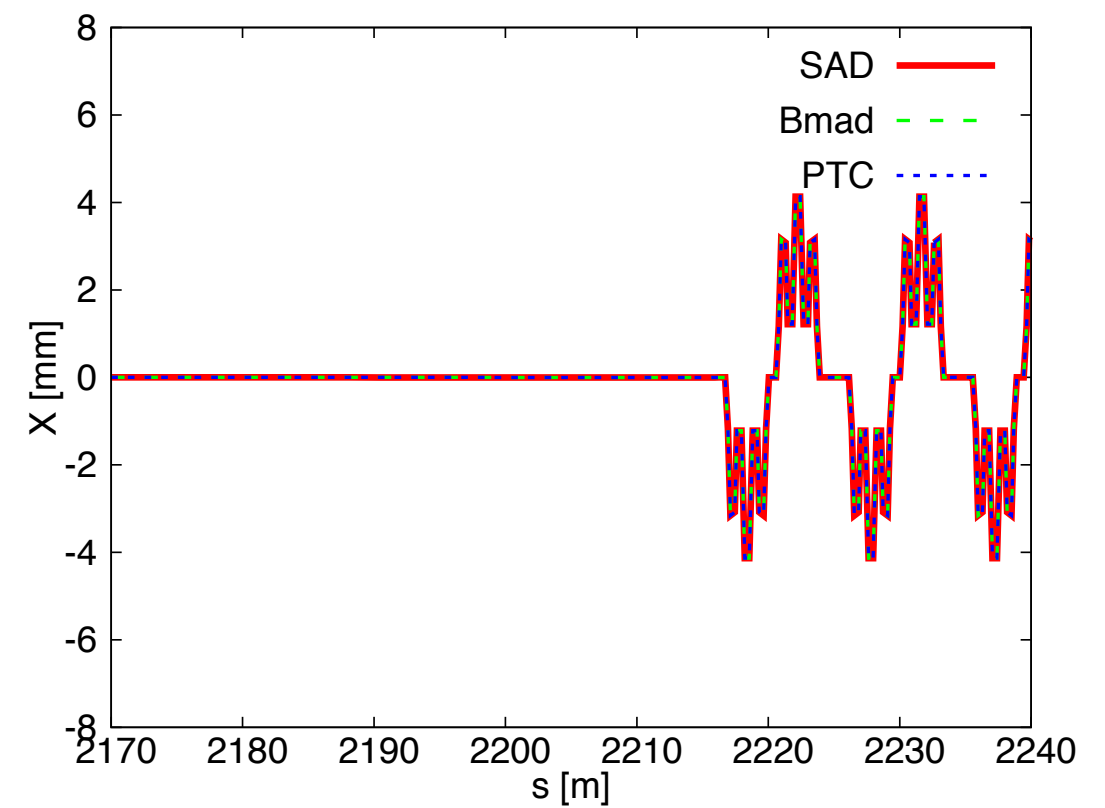
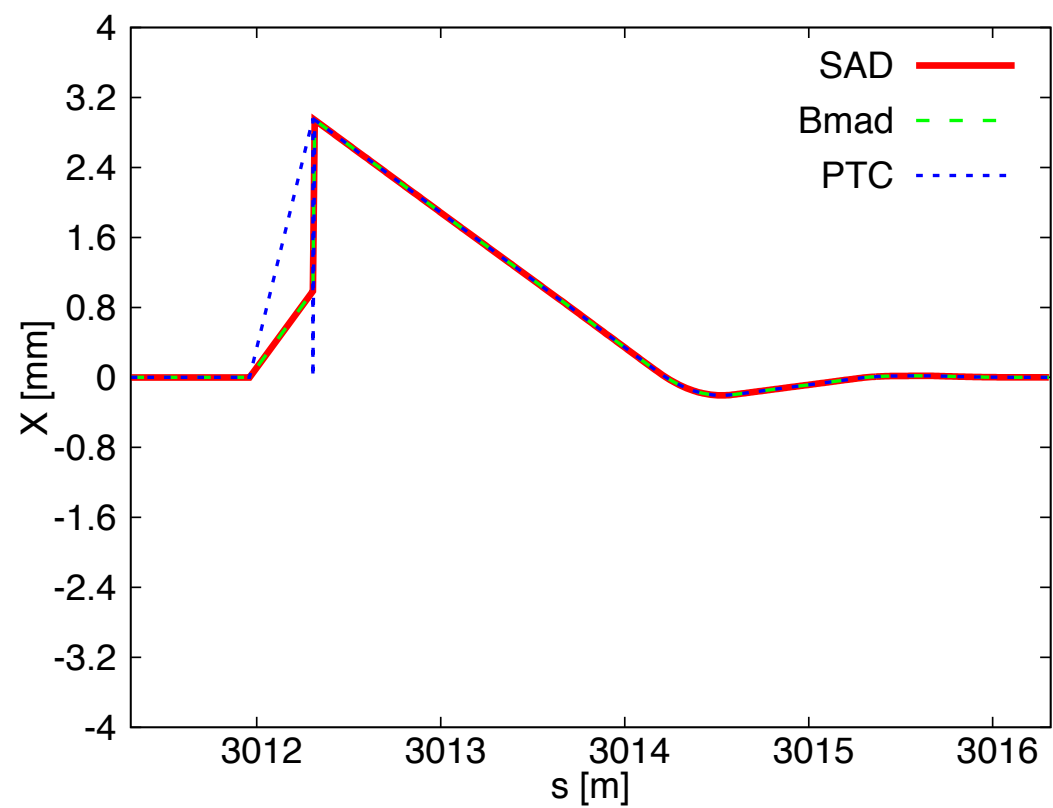
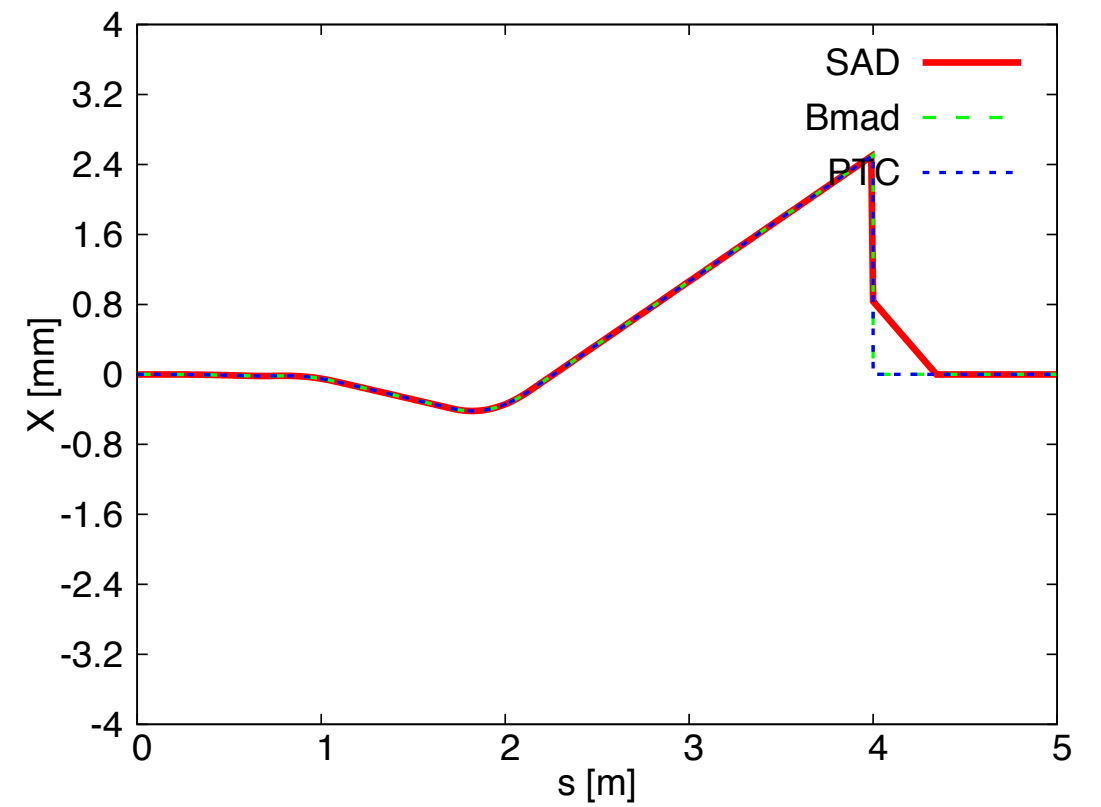
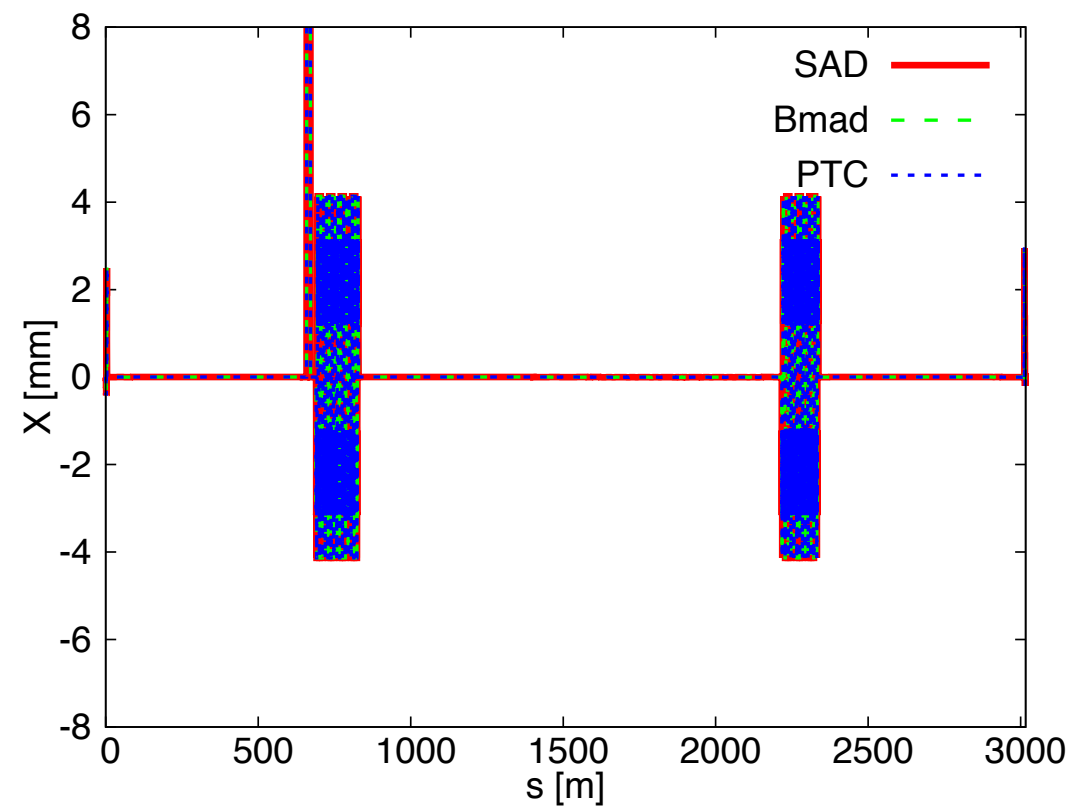
$\beta_x=0.0330051927985\text{m}$, $\alpha_x=0.0001759686421$, $v_x=44.53113$,

$D_x=-0.0000001585562\text{m}$, $D'_x=0.0000157630134$,

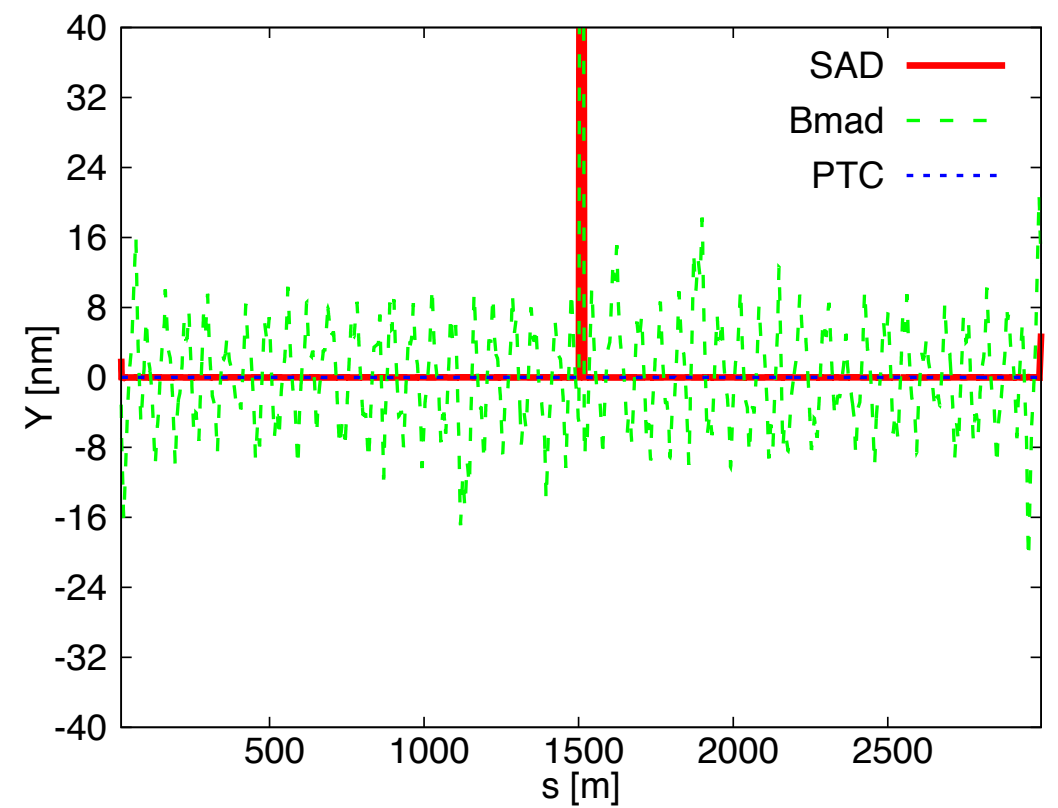
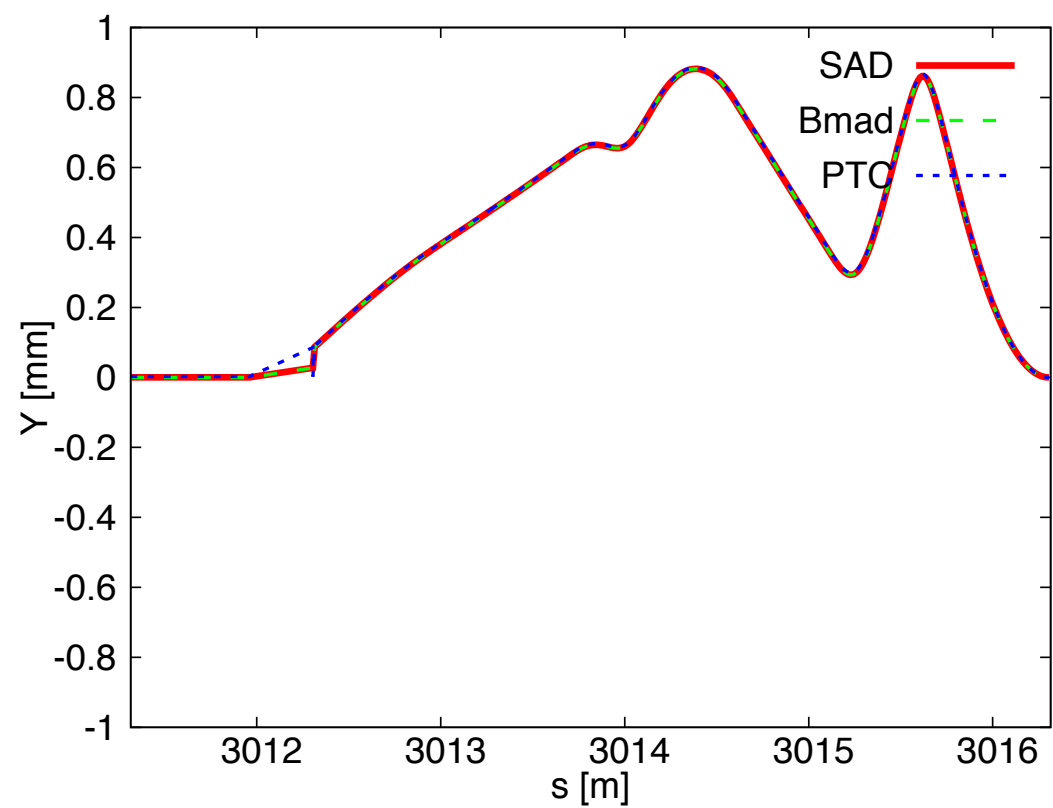
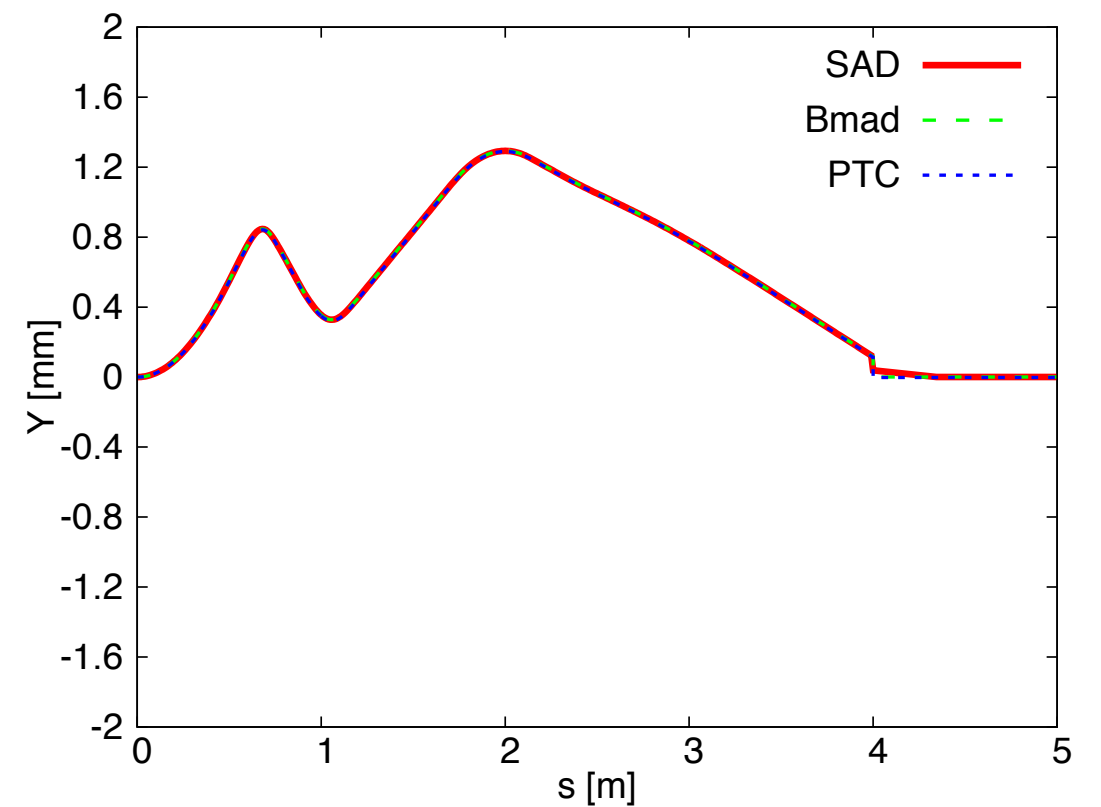
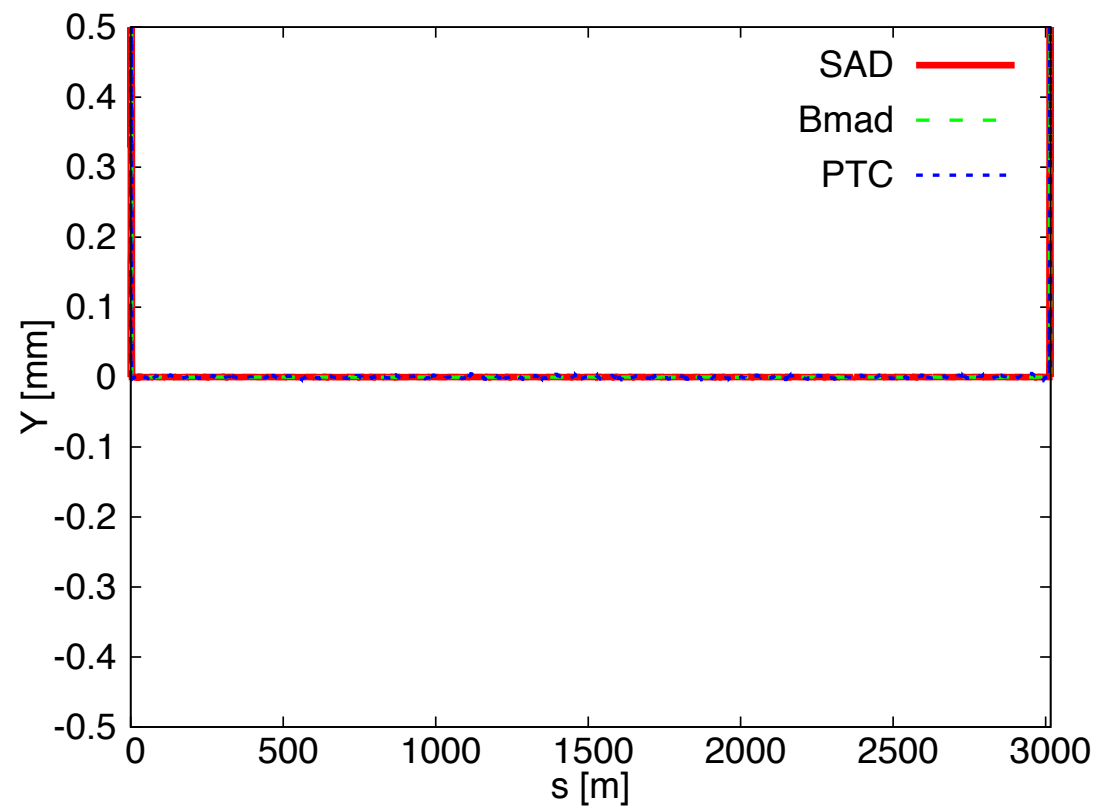
$\beta_y=0.0003034185606\text{m}$, $\alpha_y=-0.0102517001672$, $v_y=46.57934$,

$D_y=-0.0000001272302\text{m}$, $D'_y=0.0002105706129$,

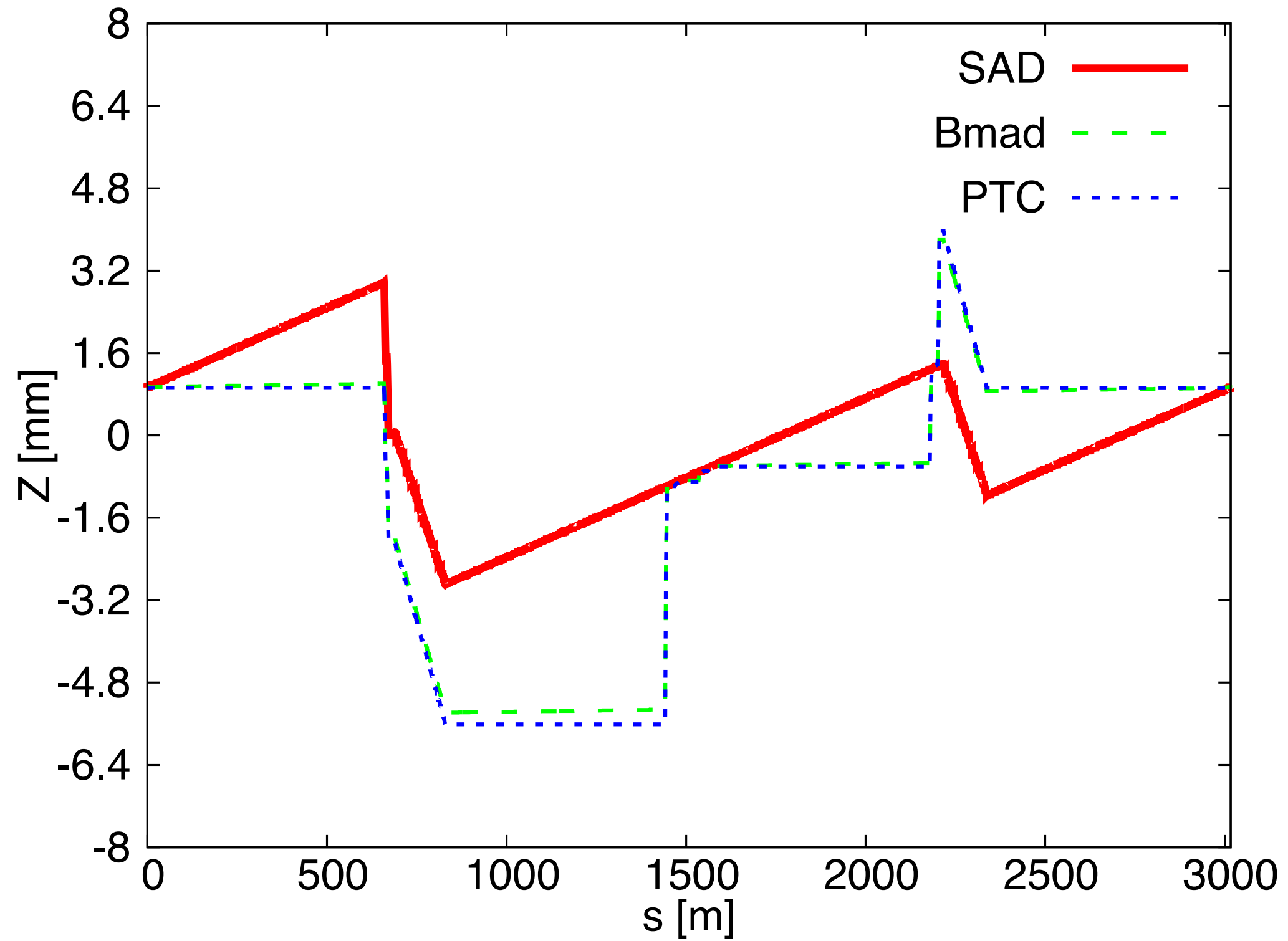
1. Closed orbit: X



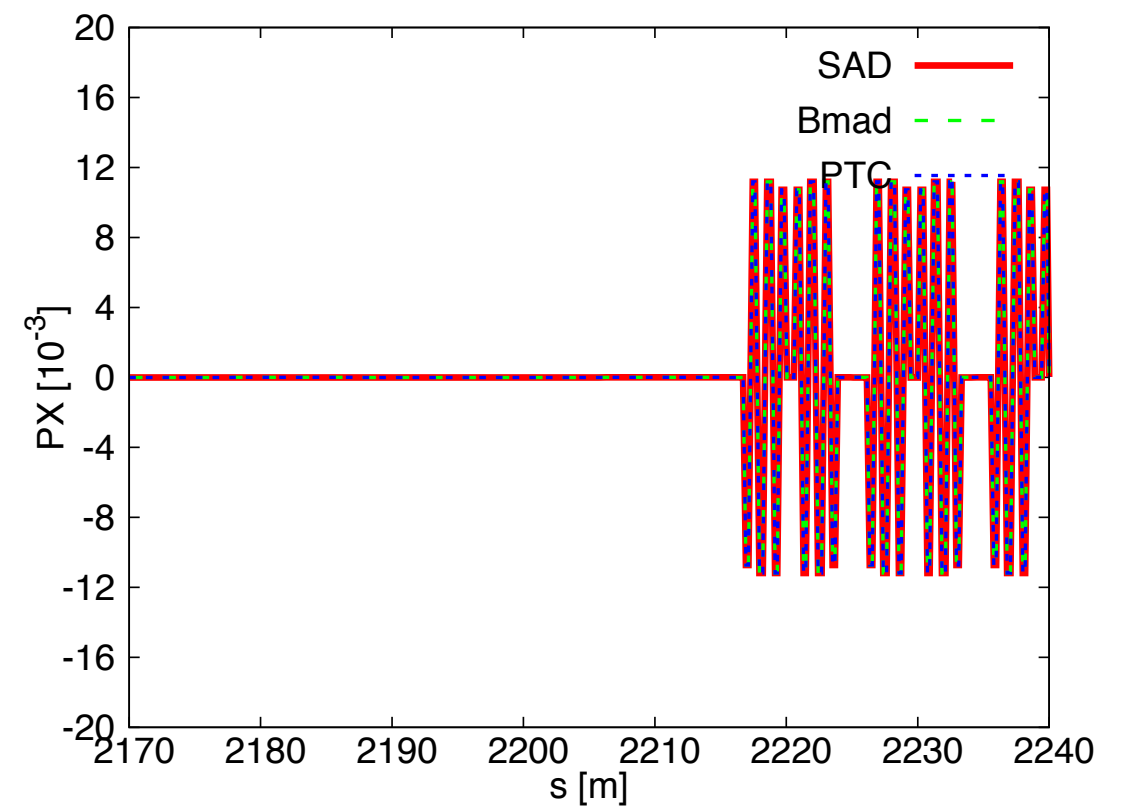
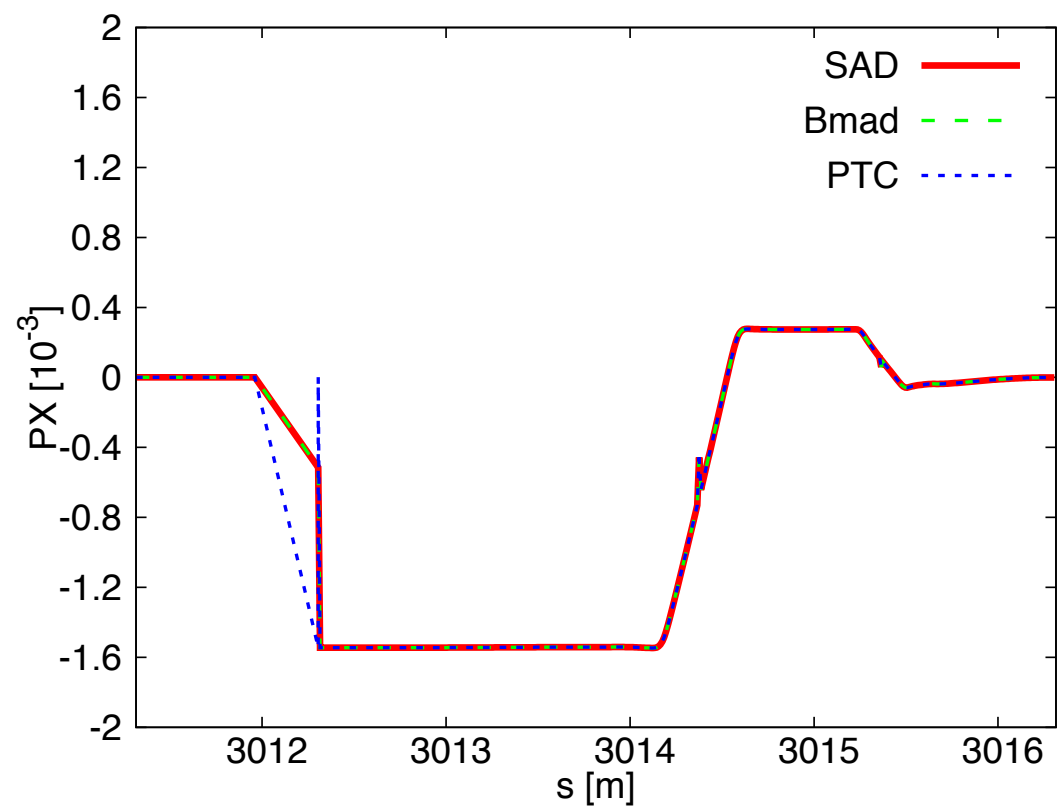
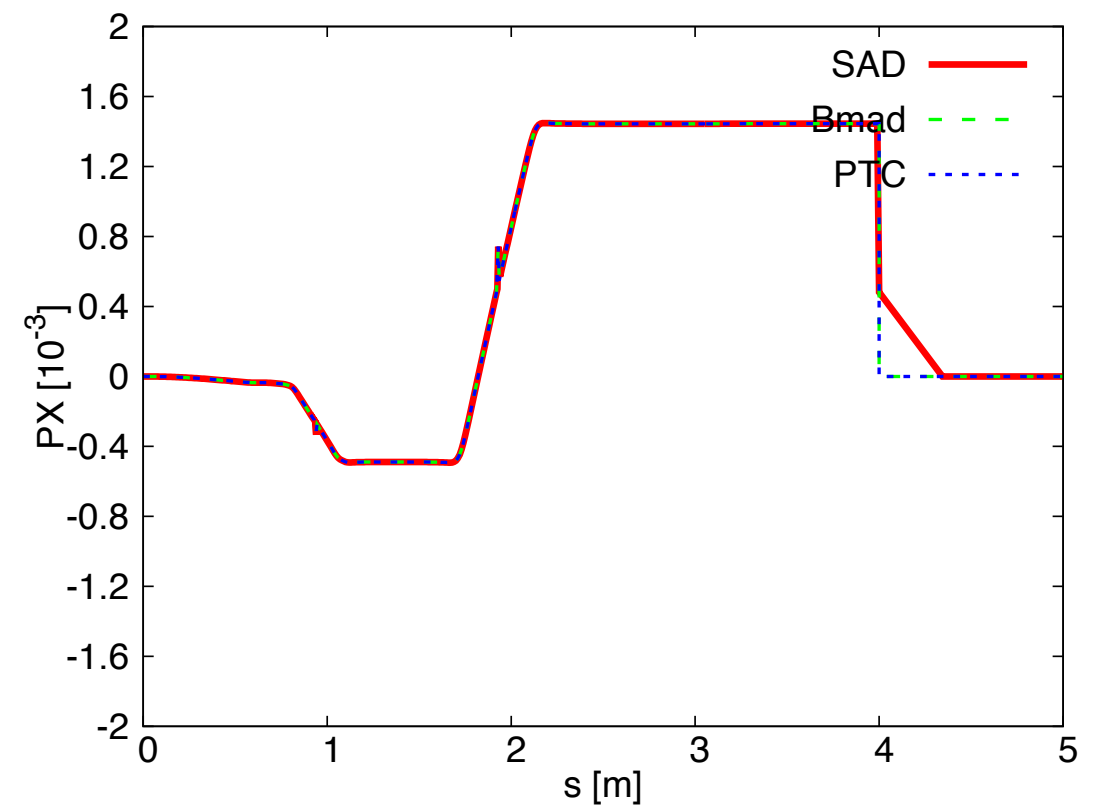
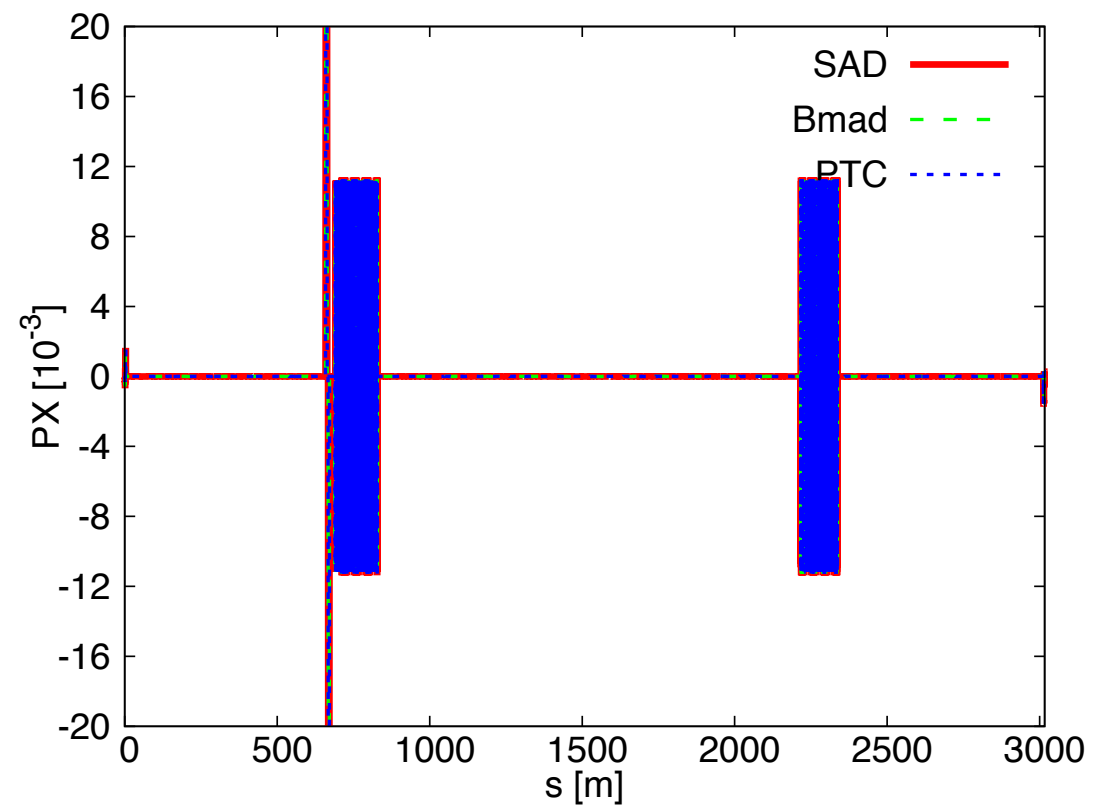
1. Closed orbit: Y



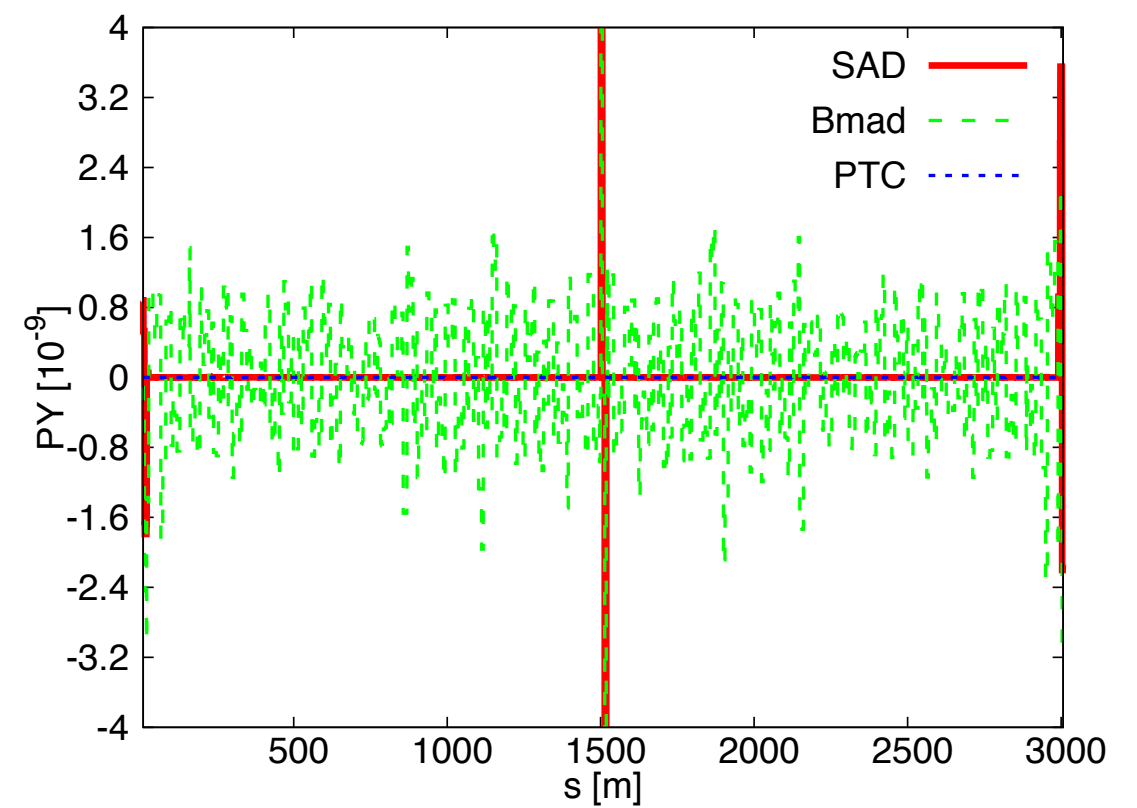
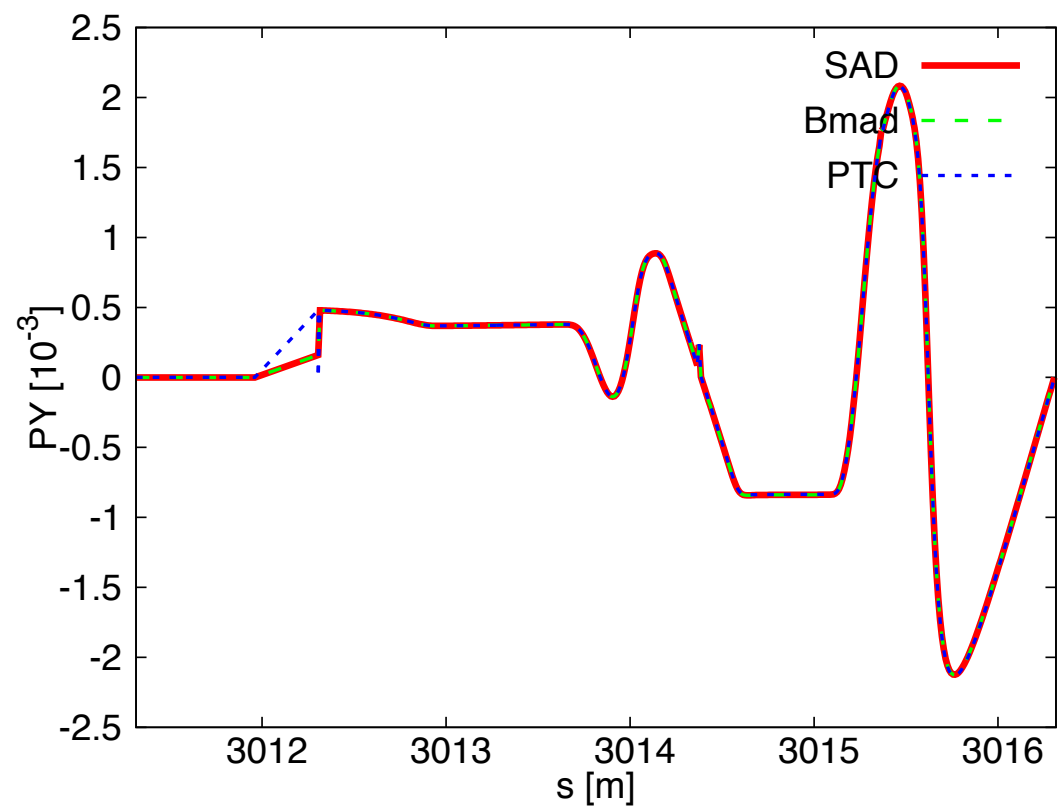
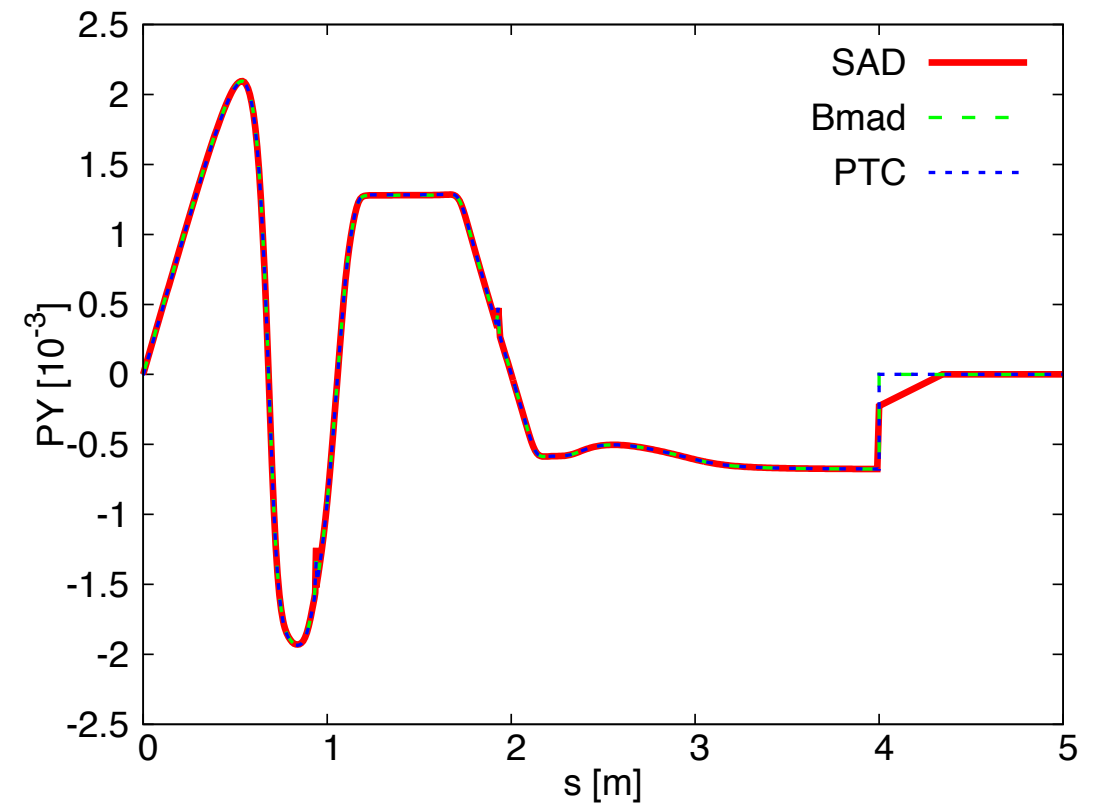
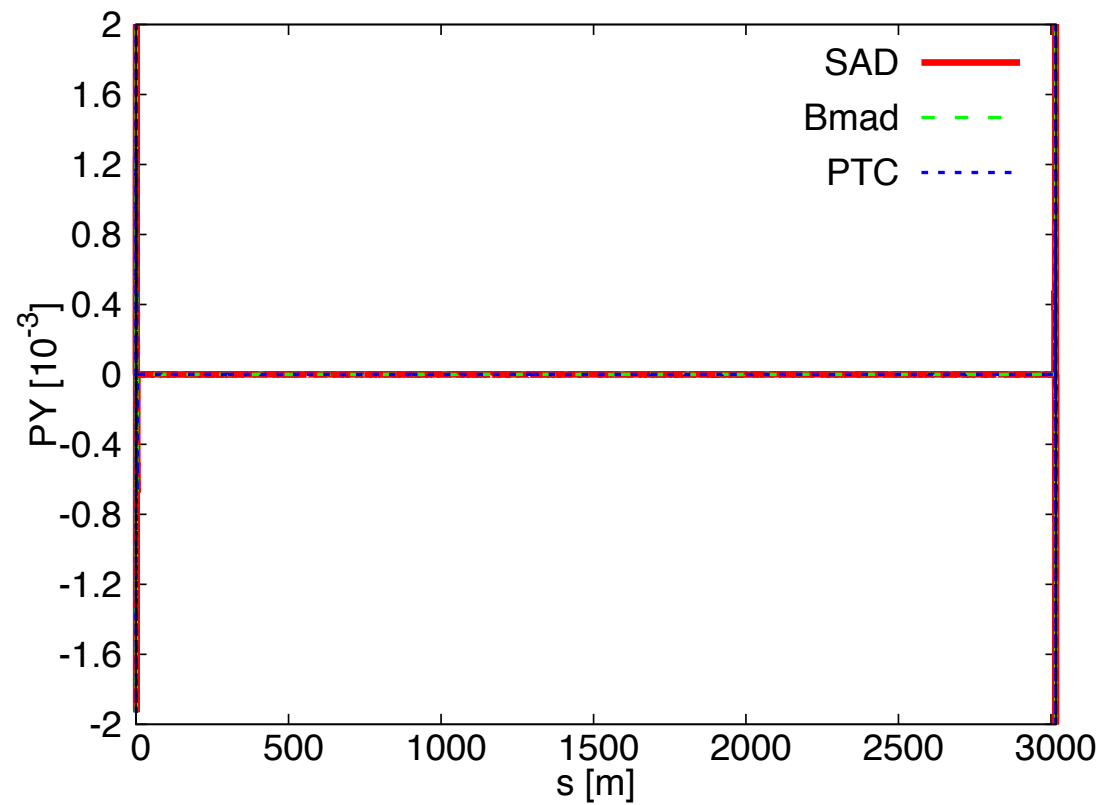
1. Closed orbit: Z



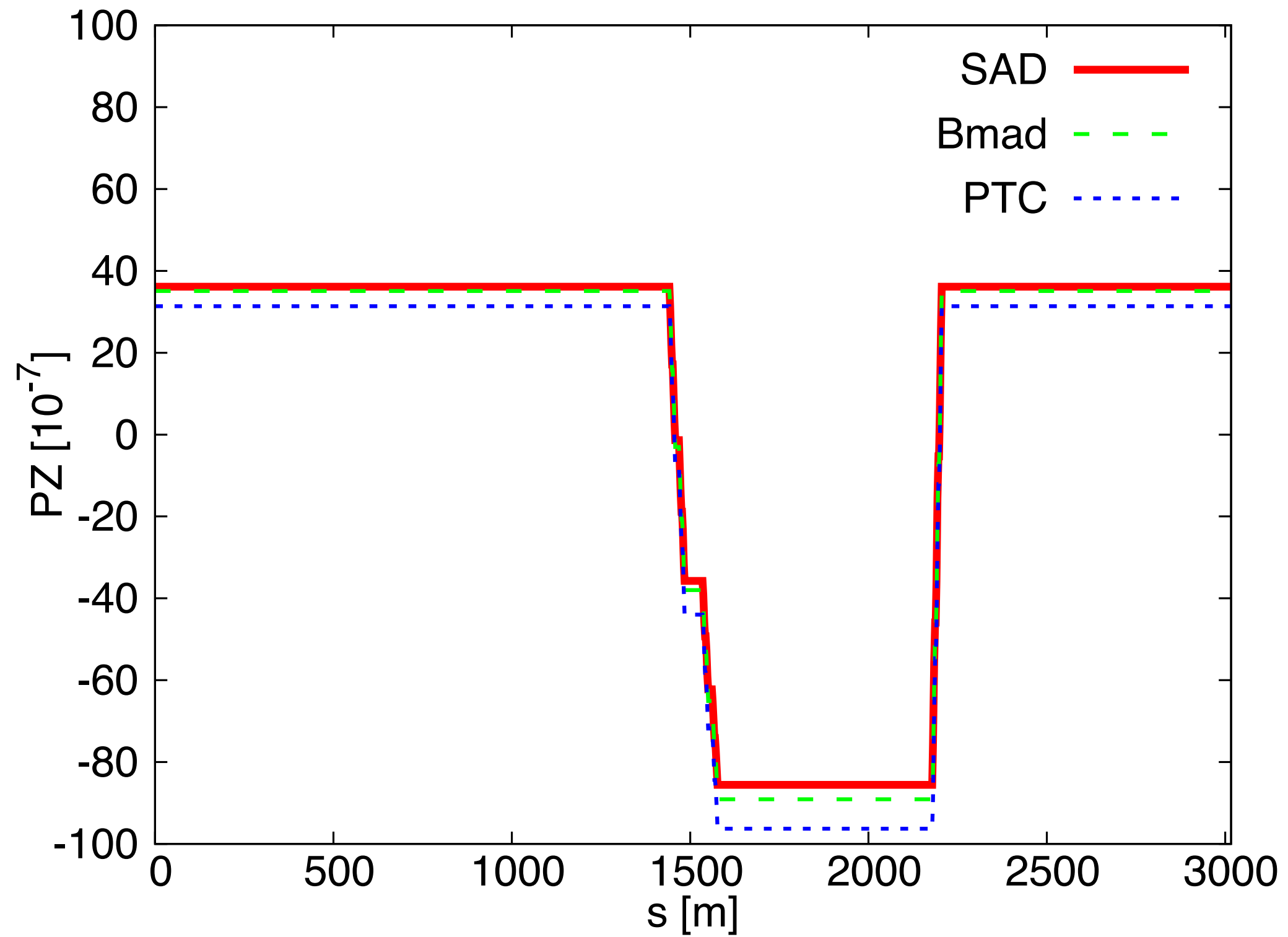
1. Closed orbit: PX



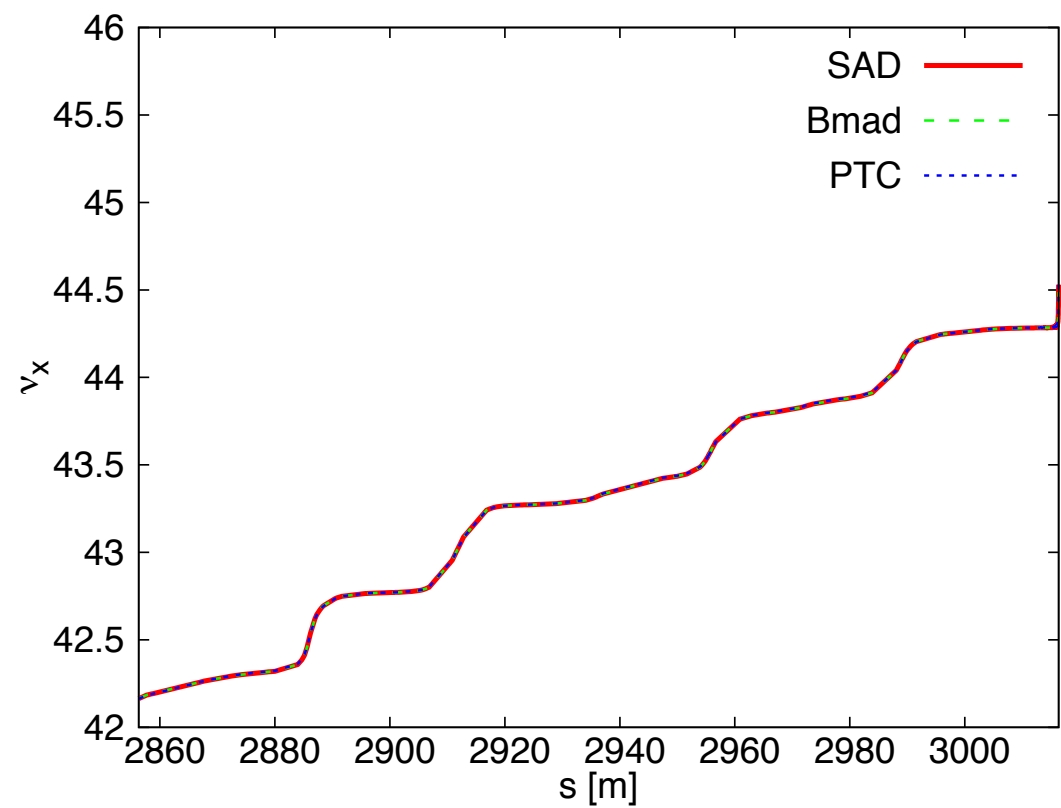
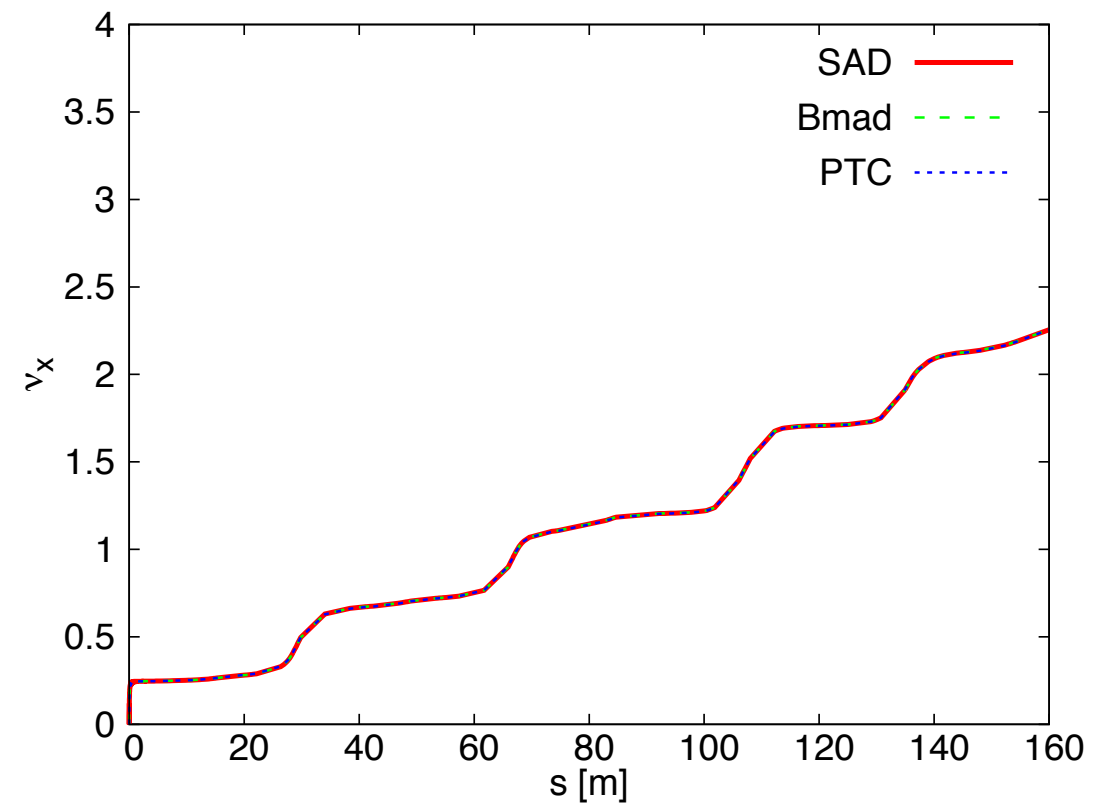
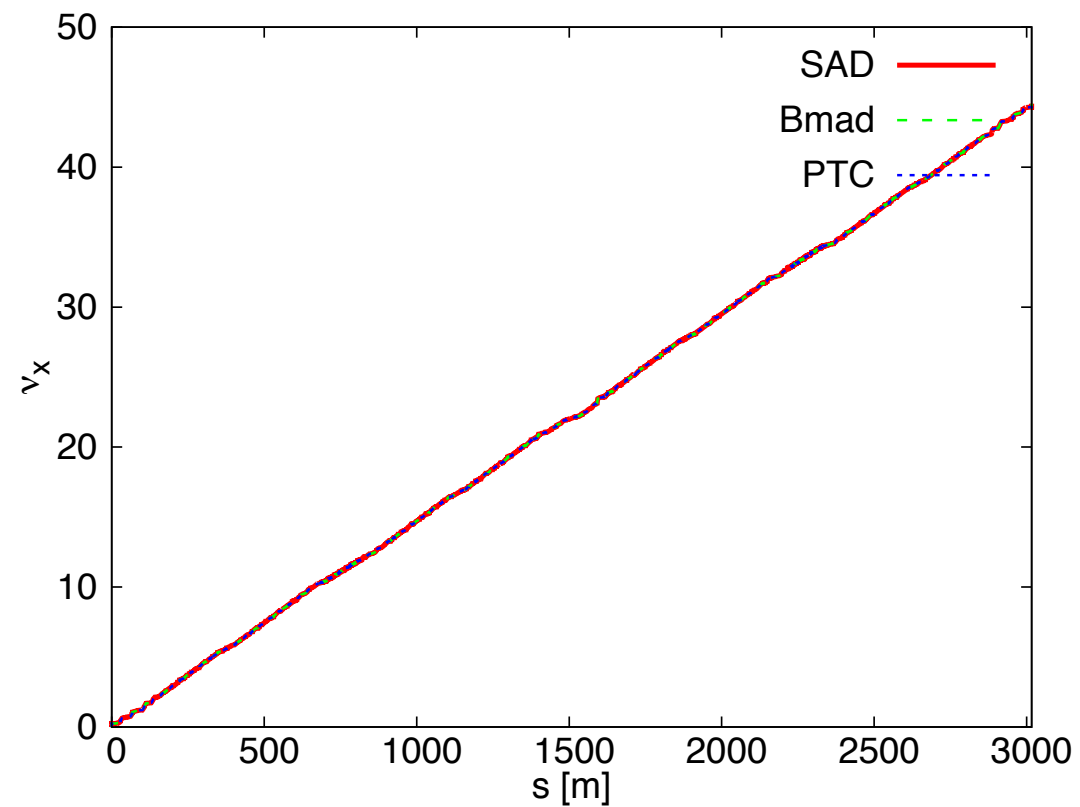
1. Closed orbit: PY



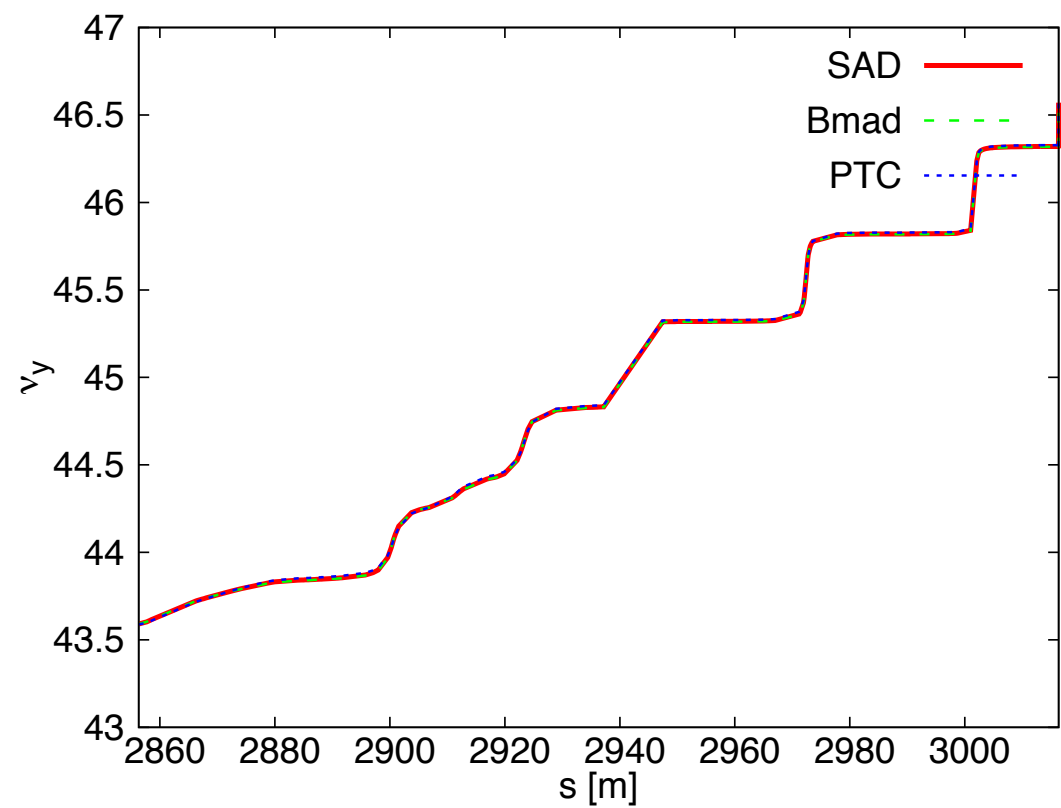
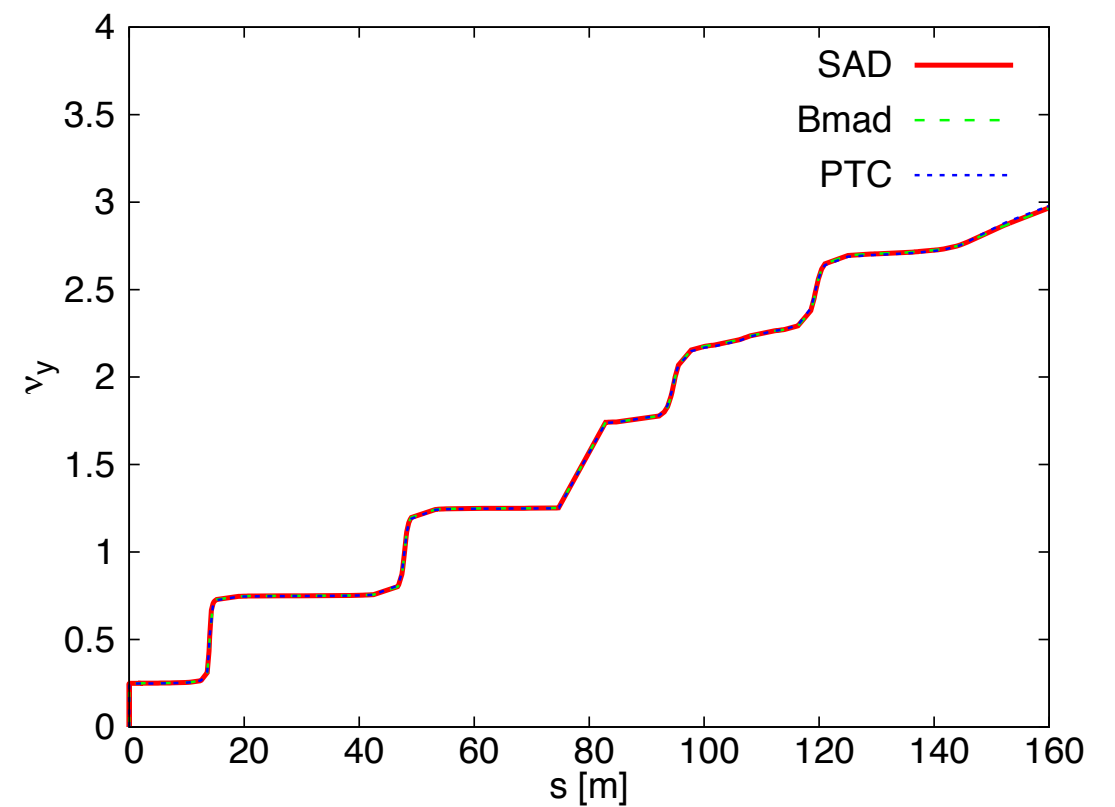
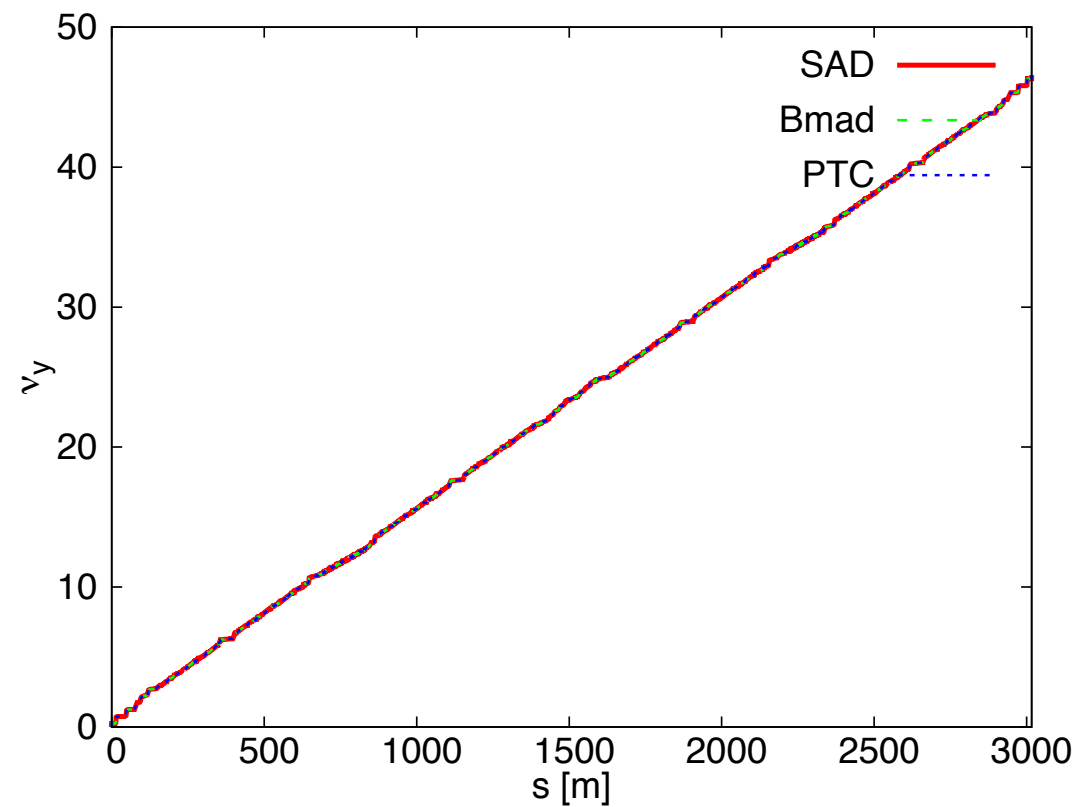
1. Closed orbit: PZ



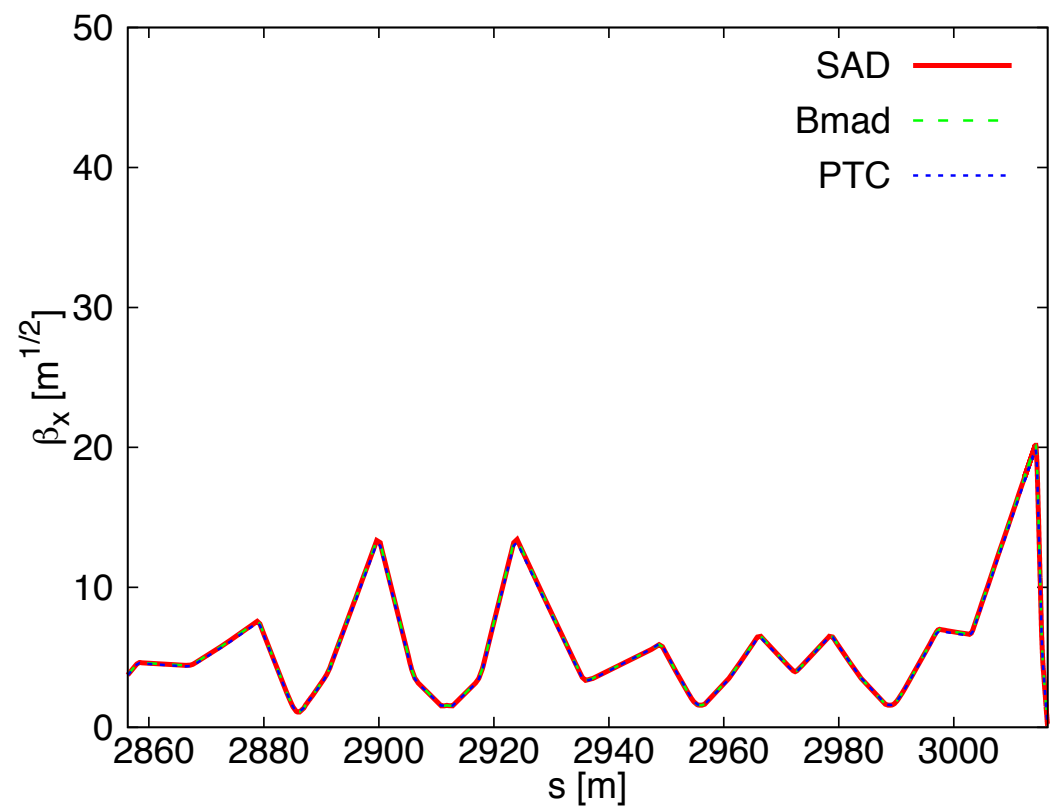
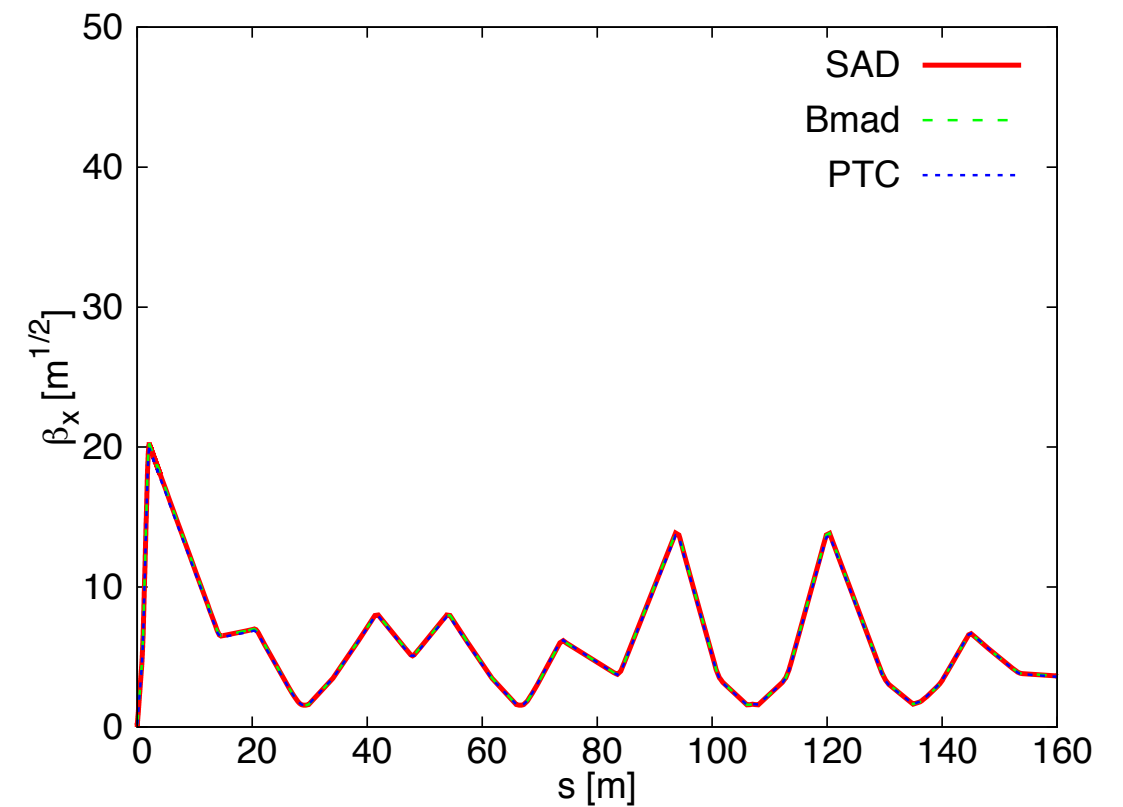
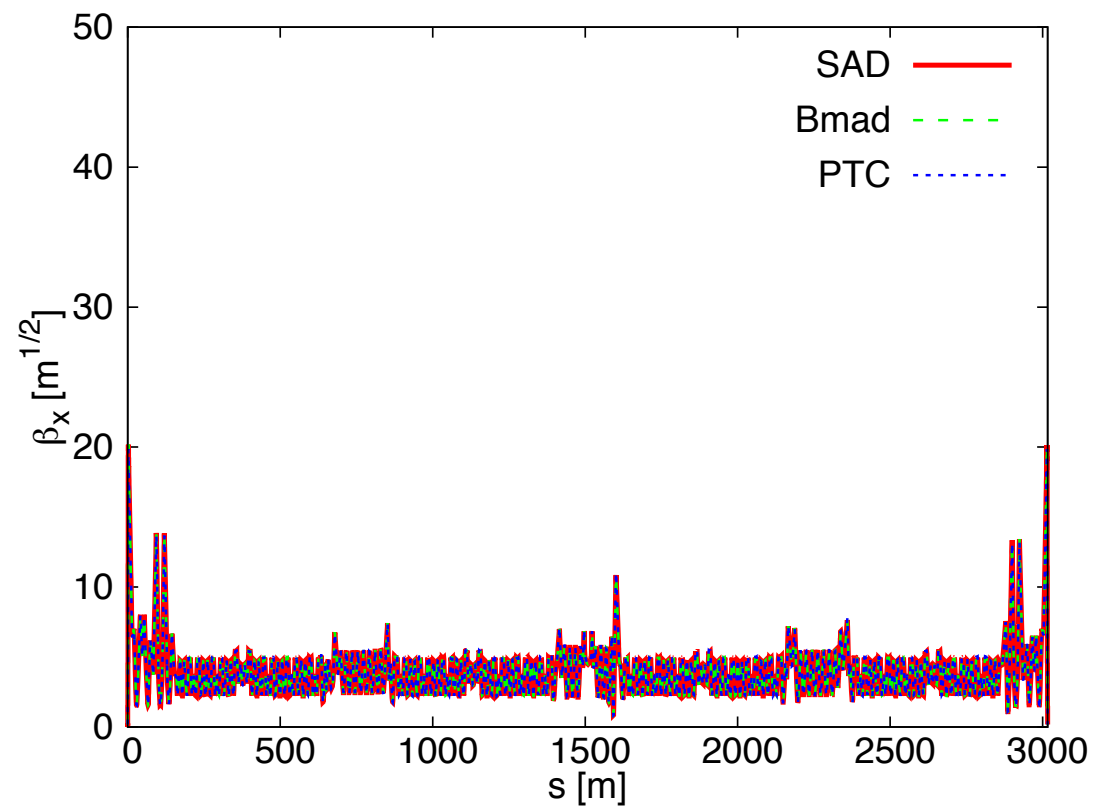
1. Closed orbit: NuX



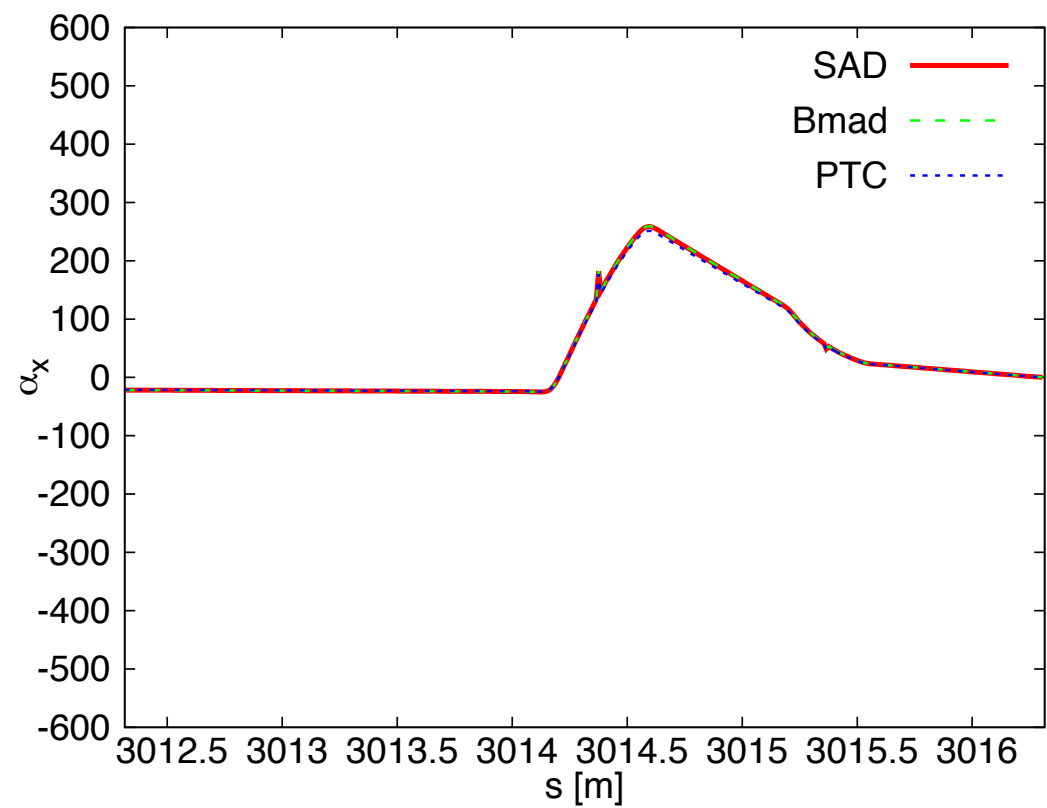
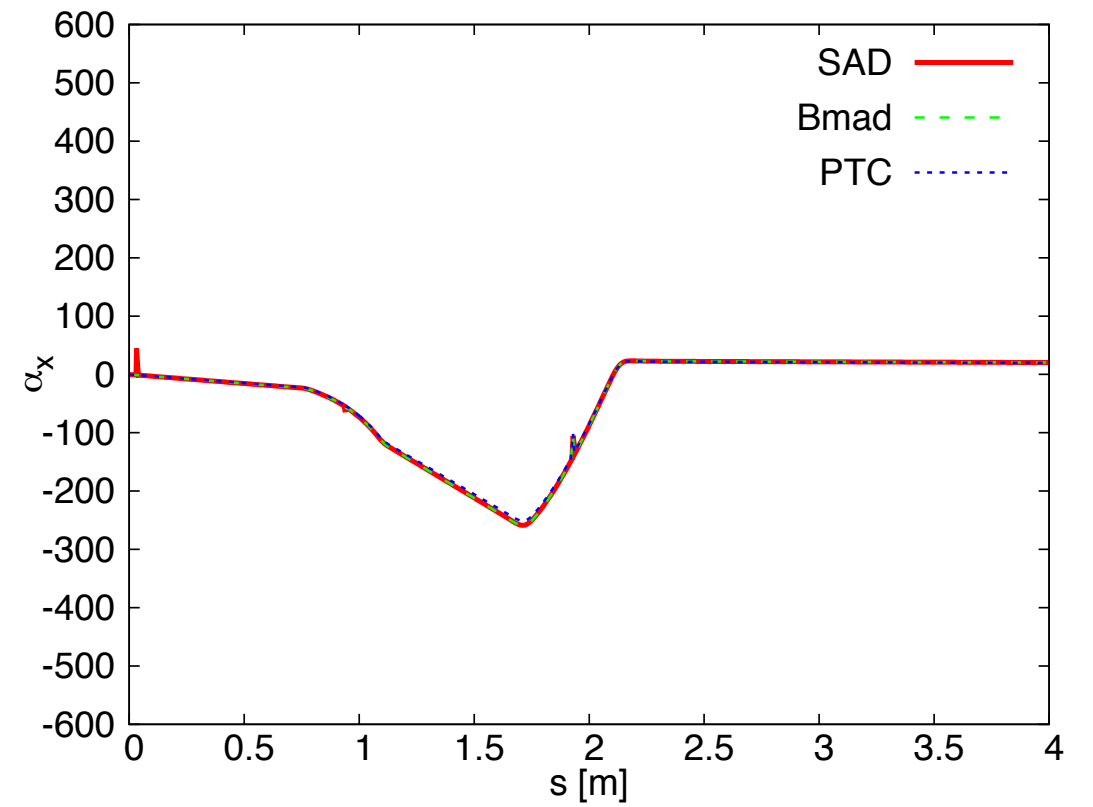
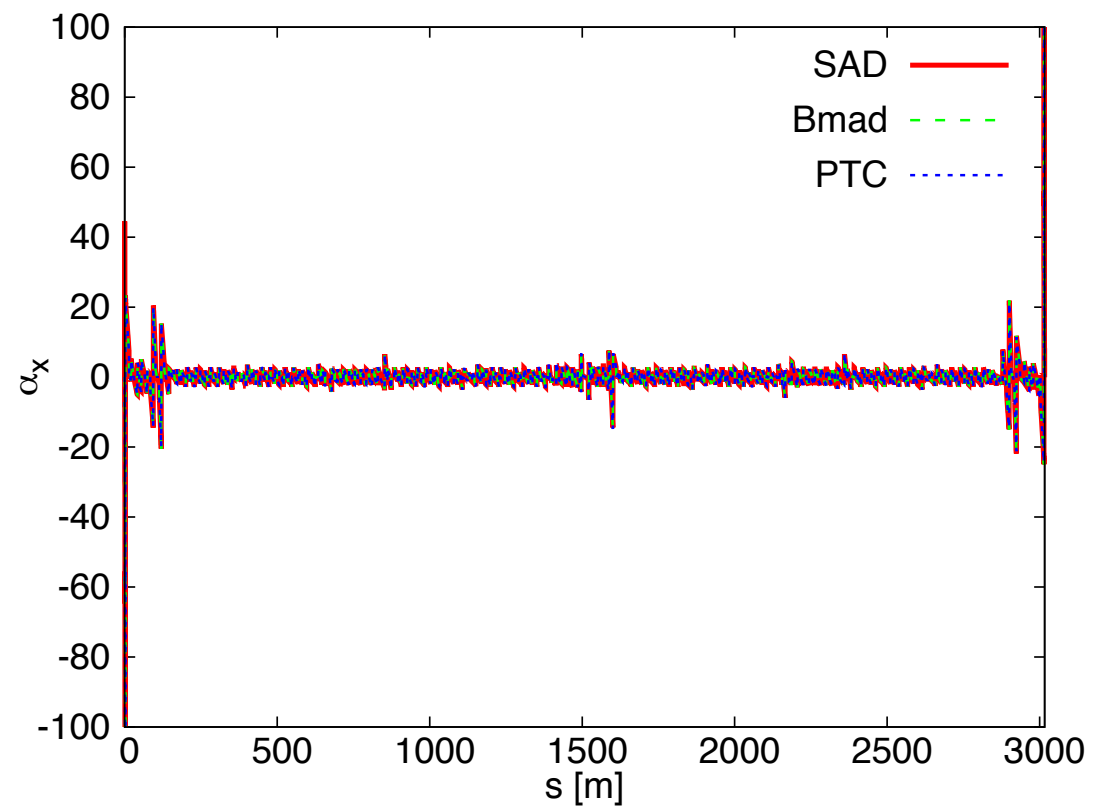
1. Closed orbit: NuY



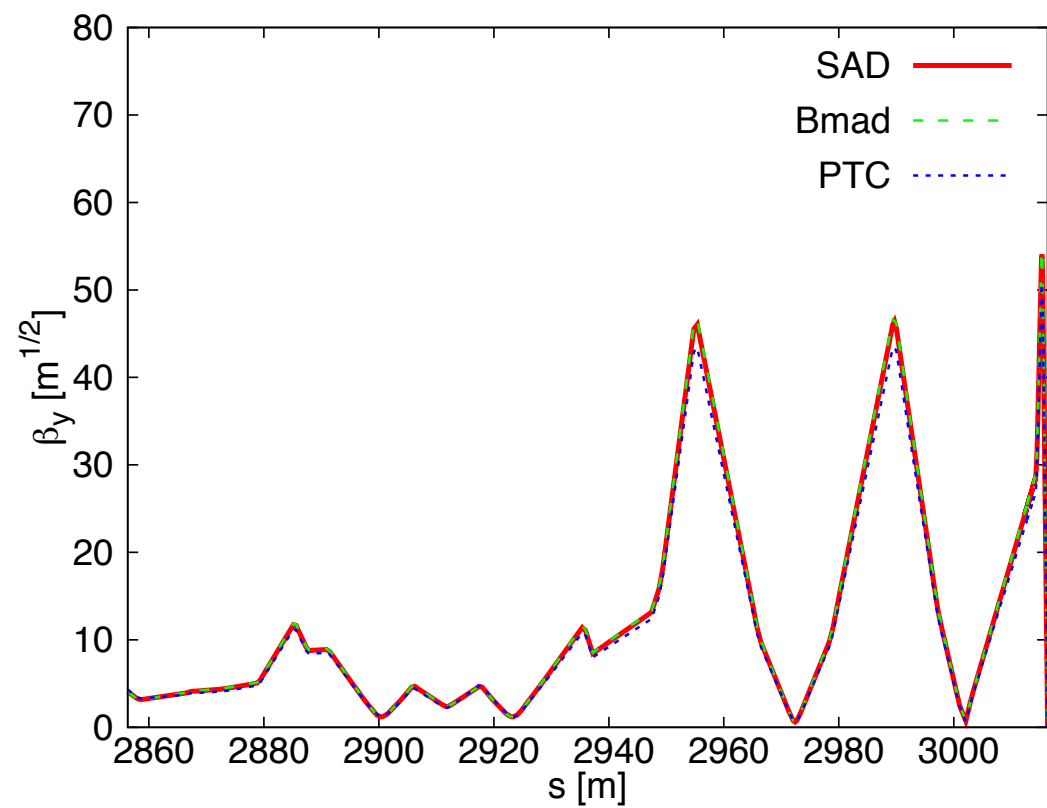
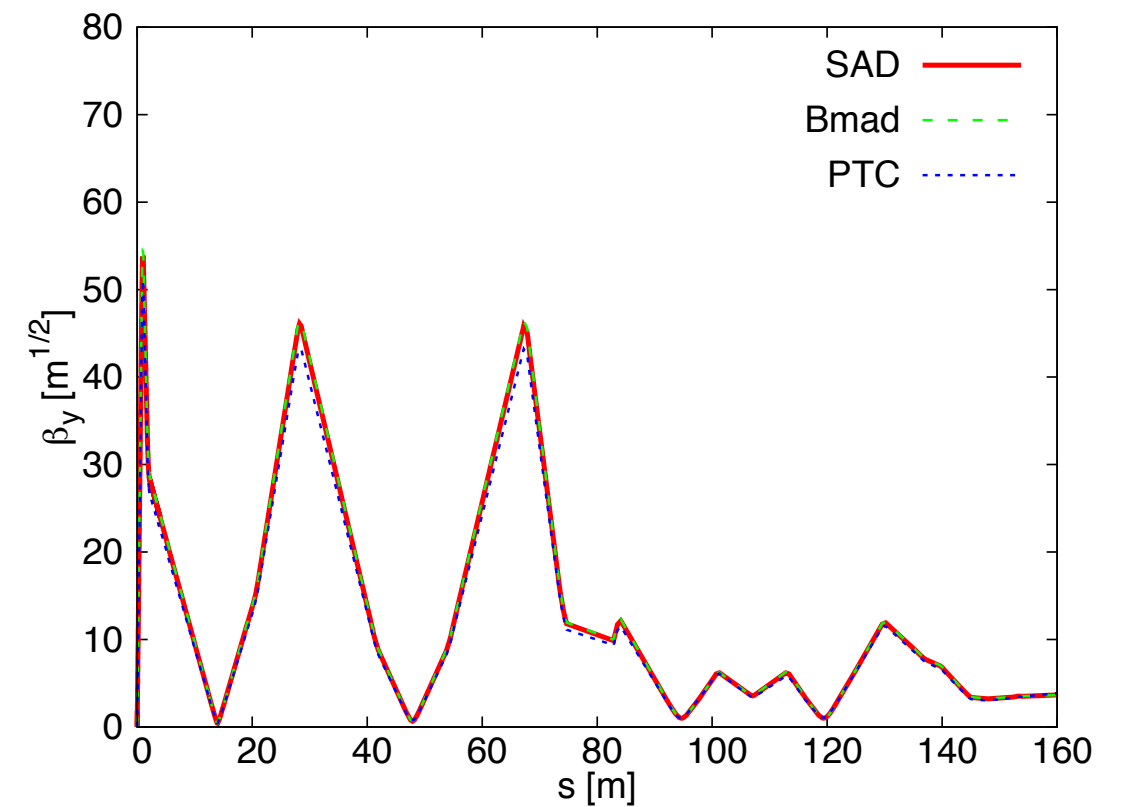
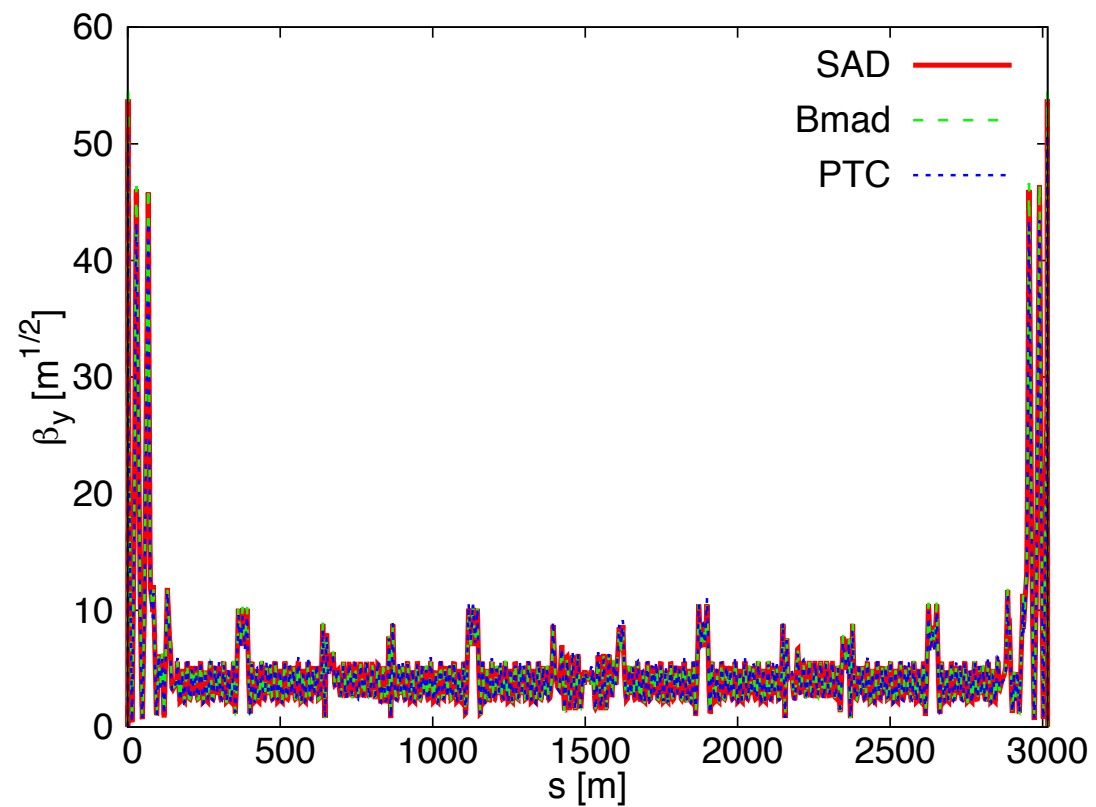
1. Twiss function: BetaX



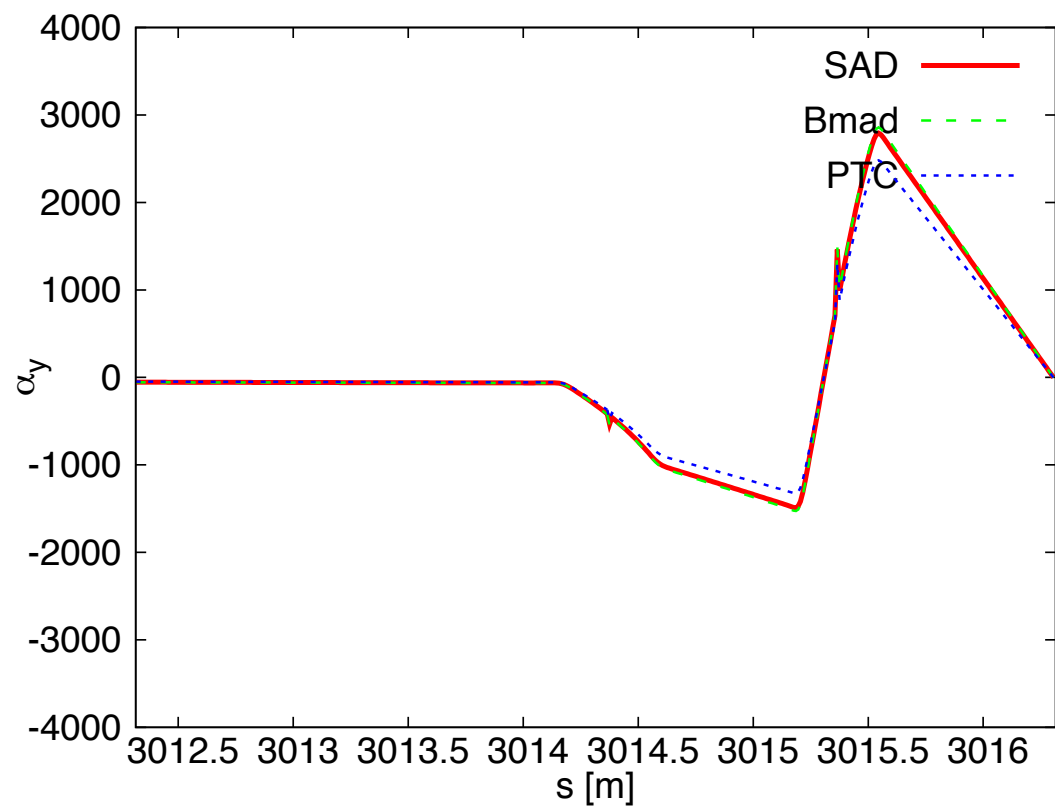
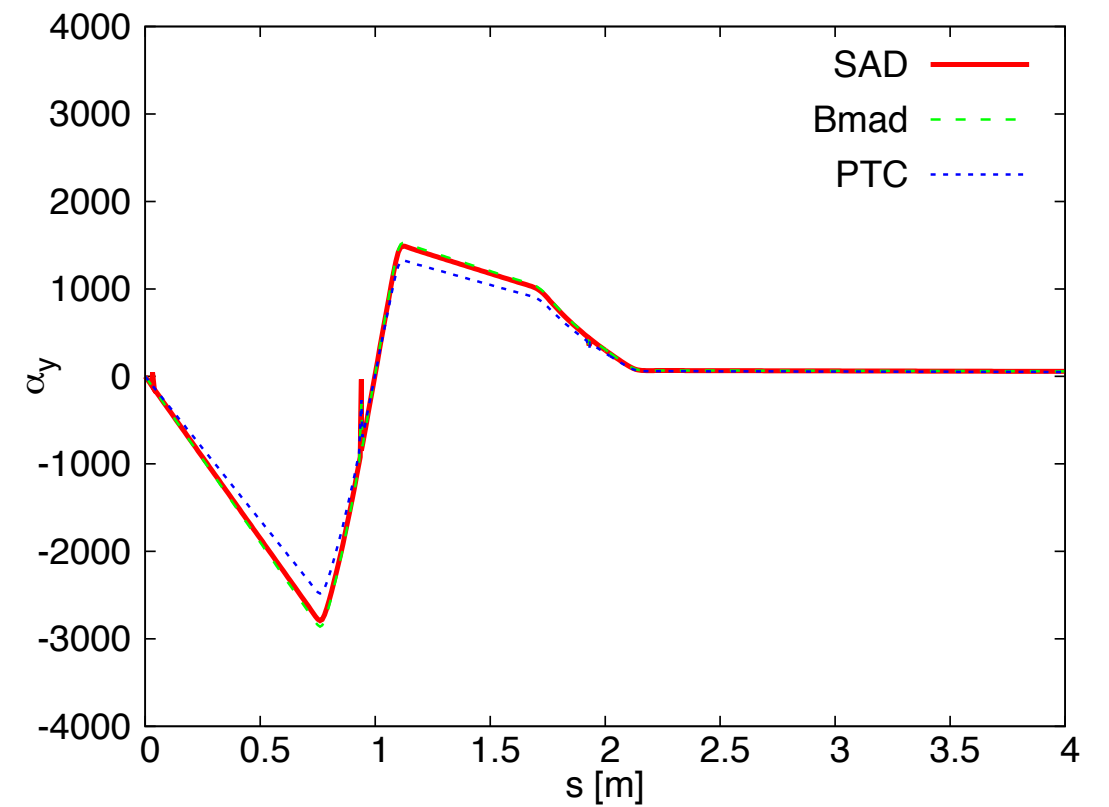
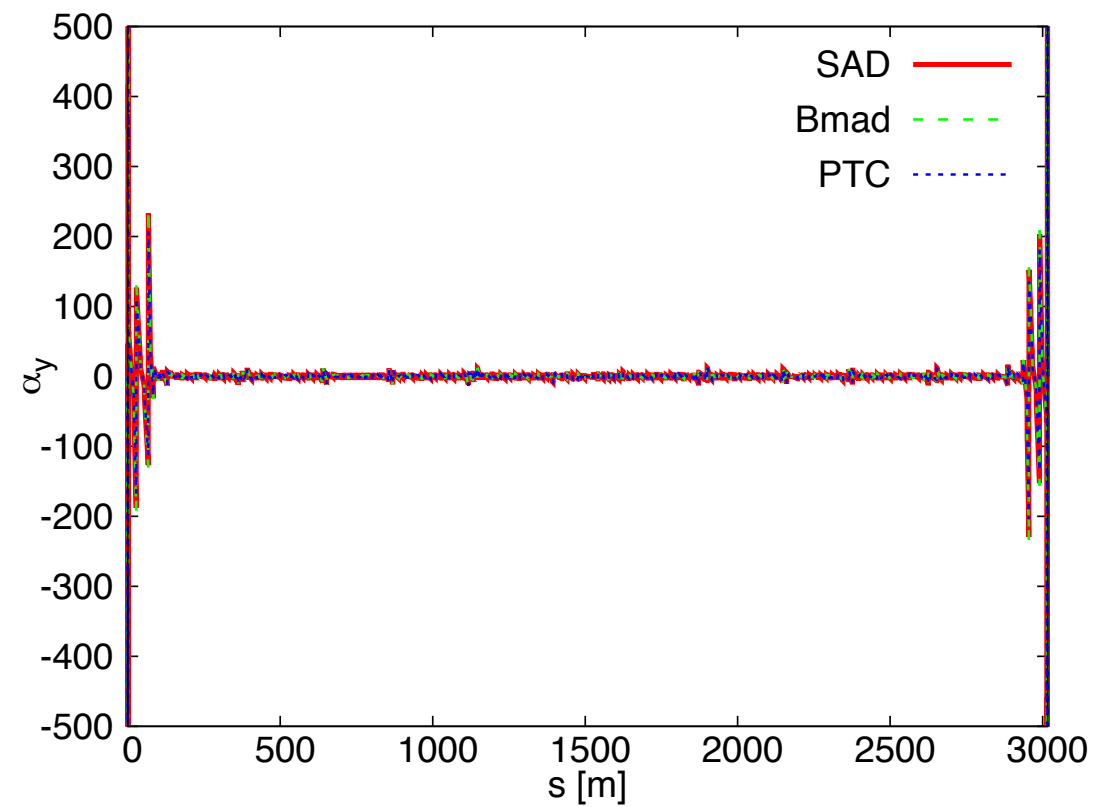
1. Twiss function: AlphaX



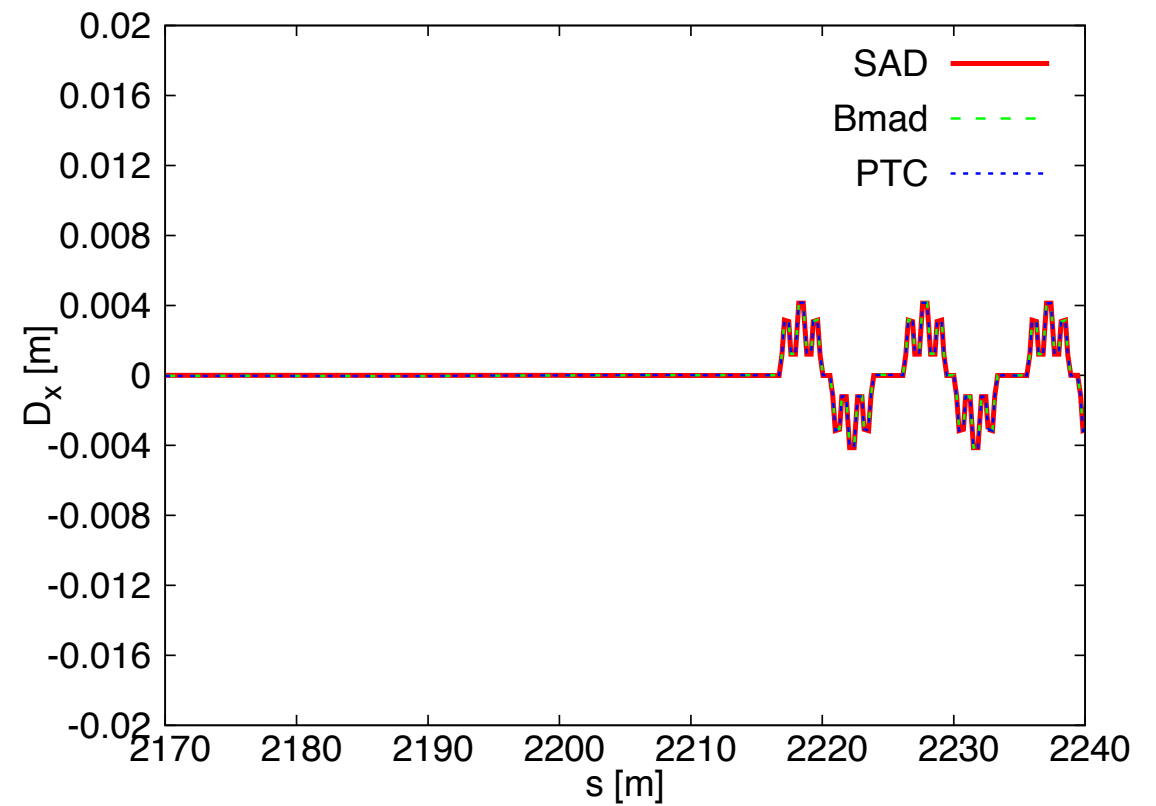
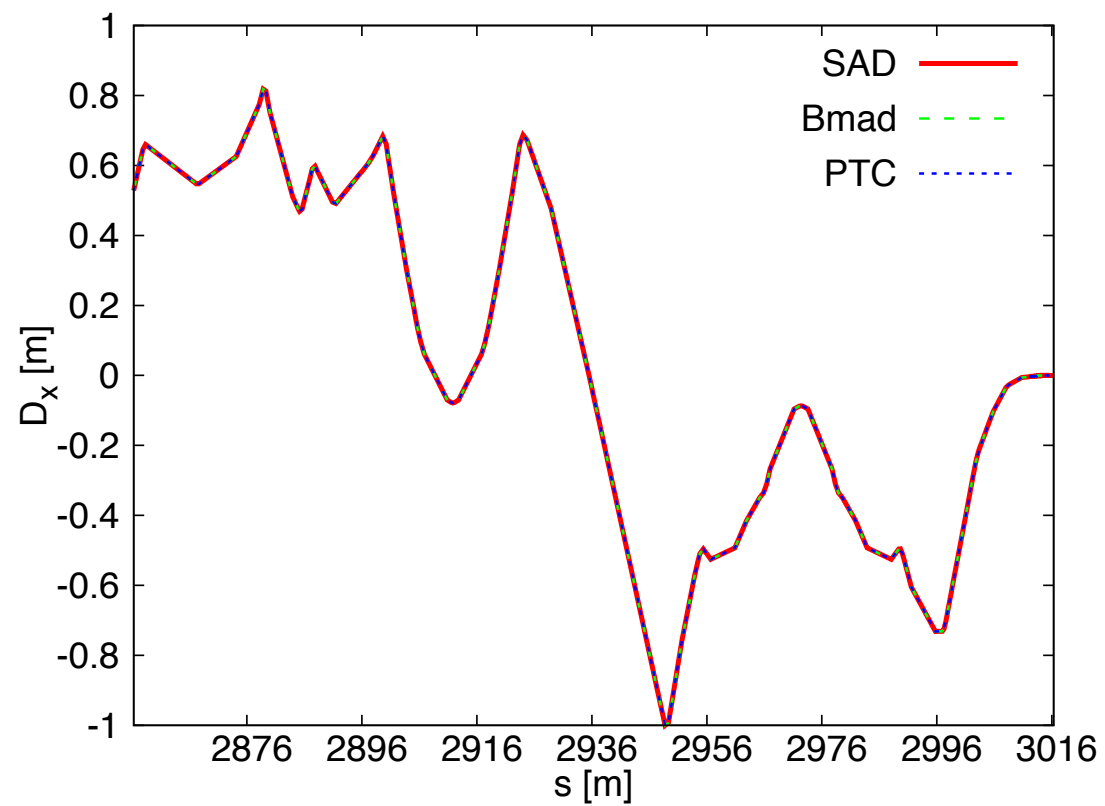
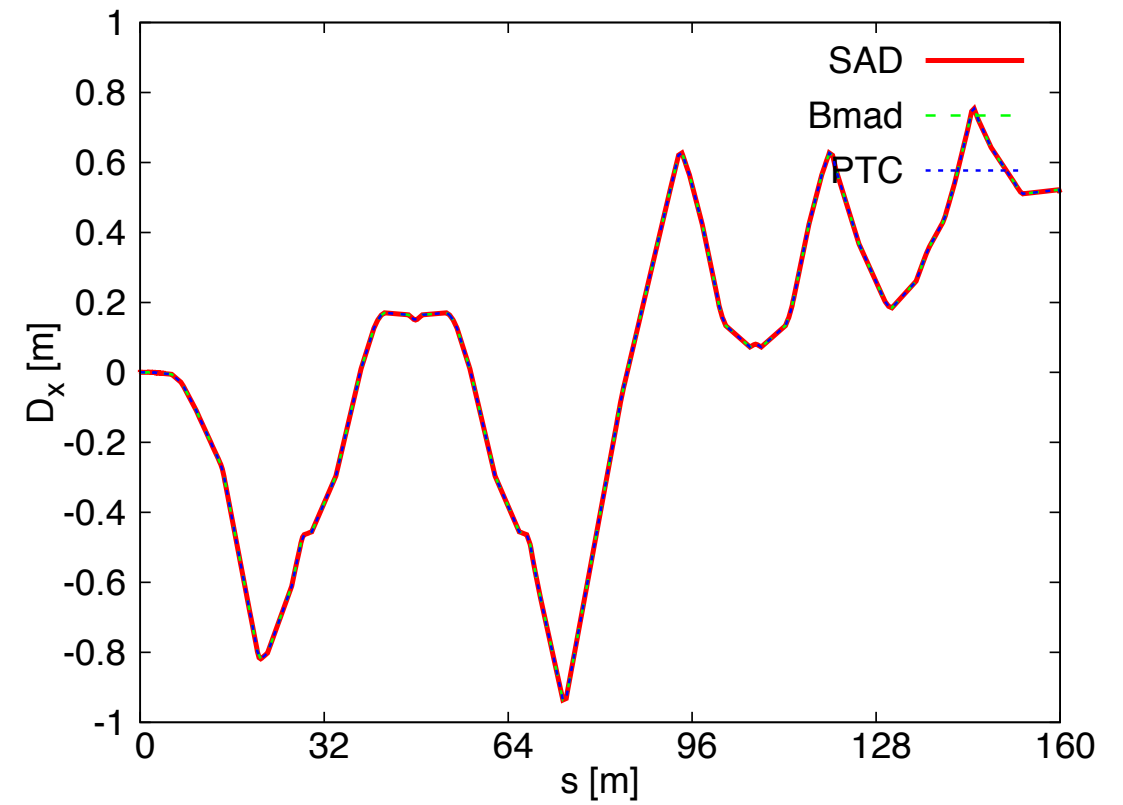
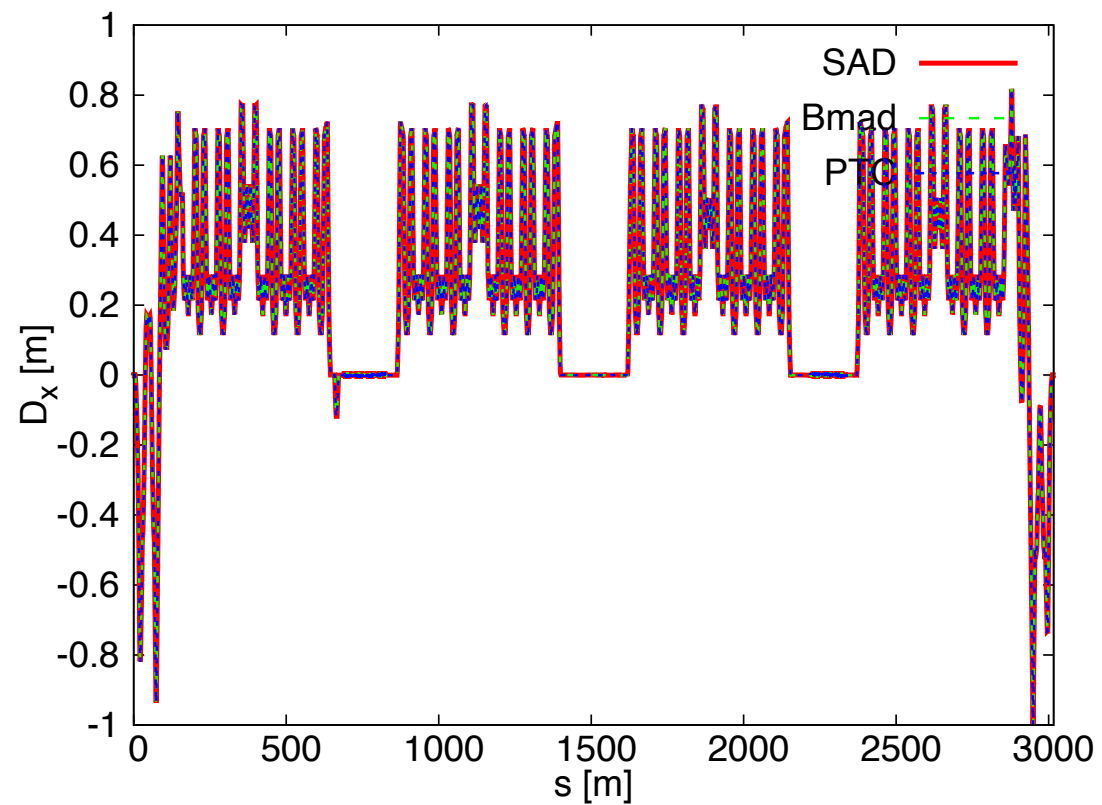
1. Twiss function: BetaY



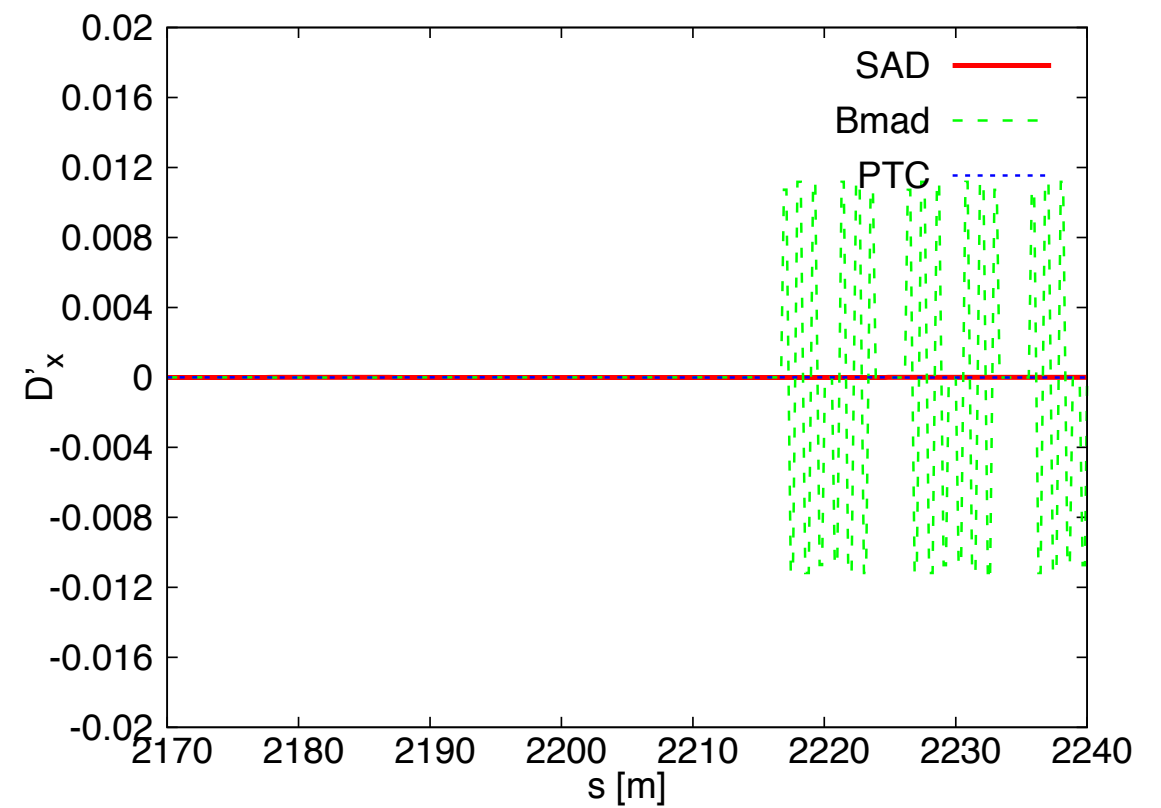
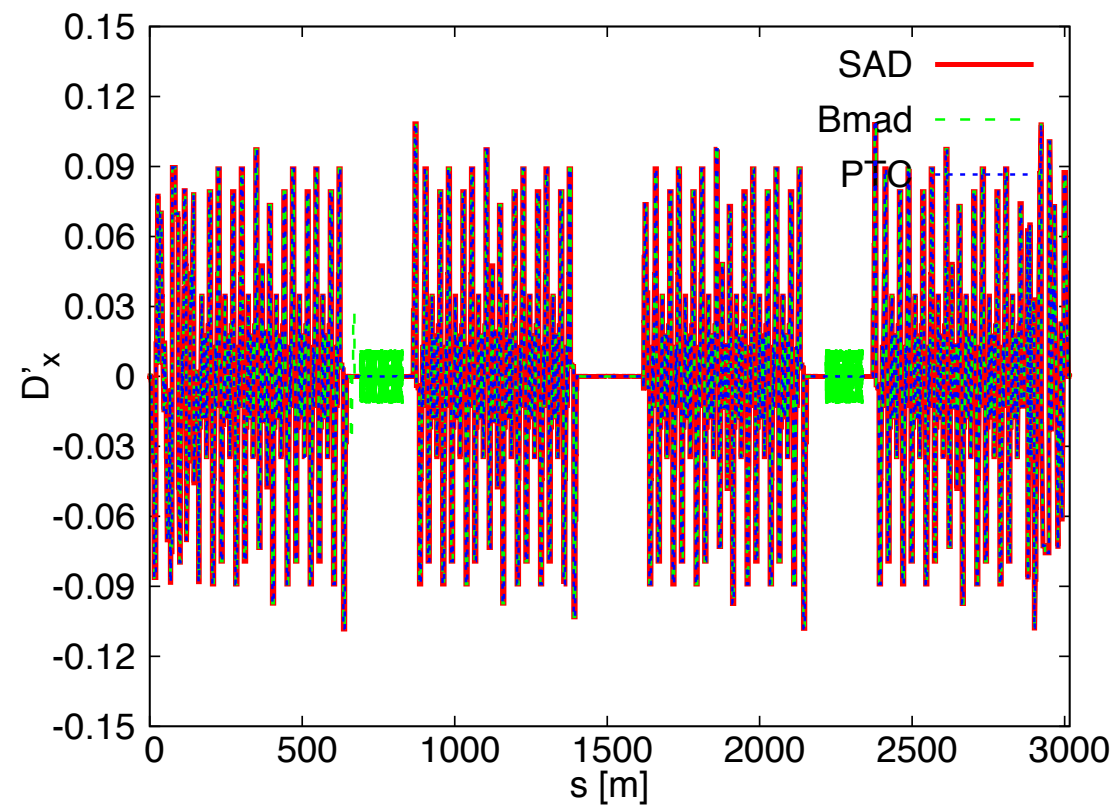
1. Twiss function: AlphaY



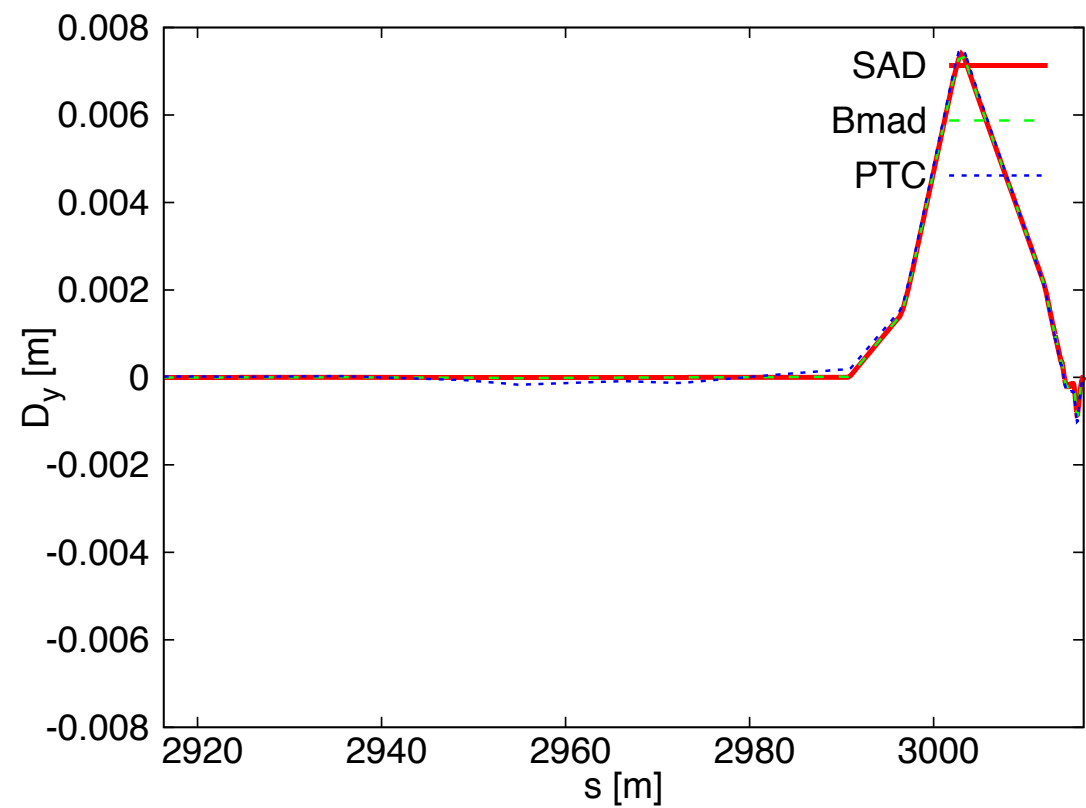
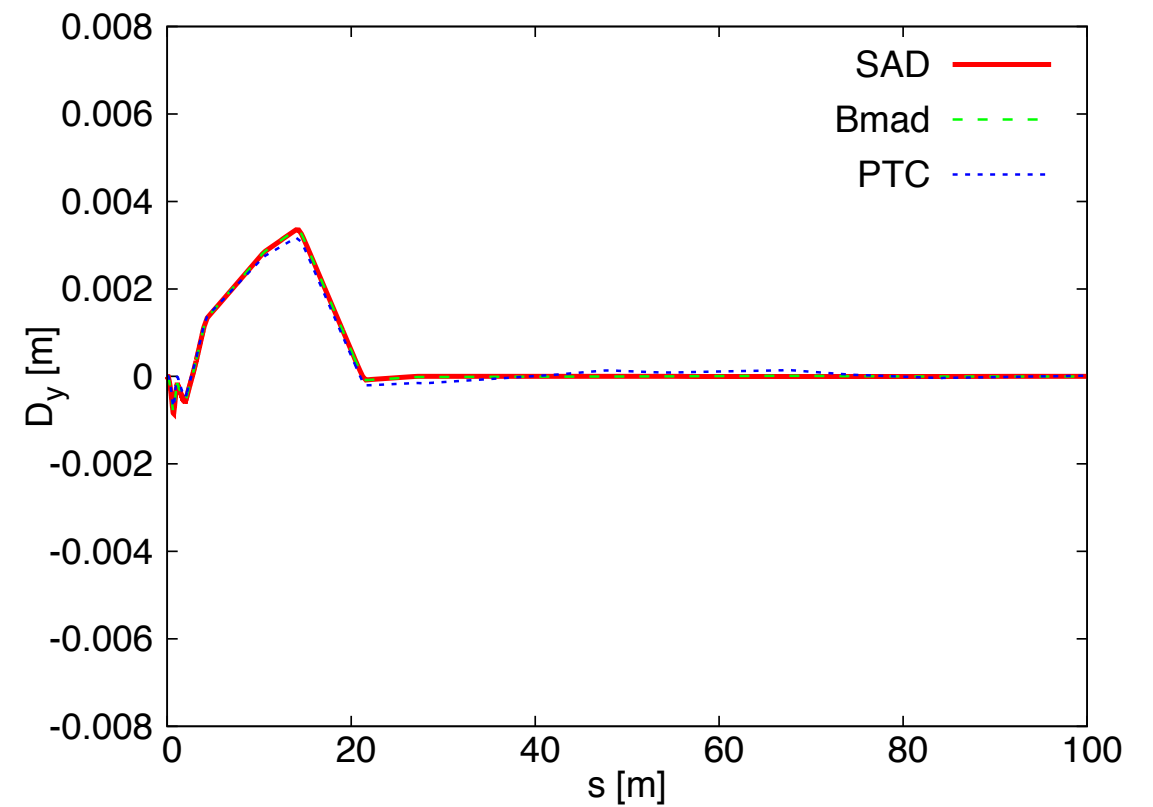
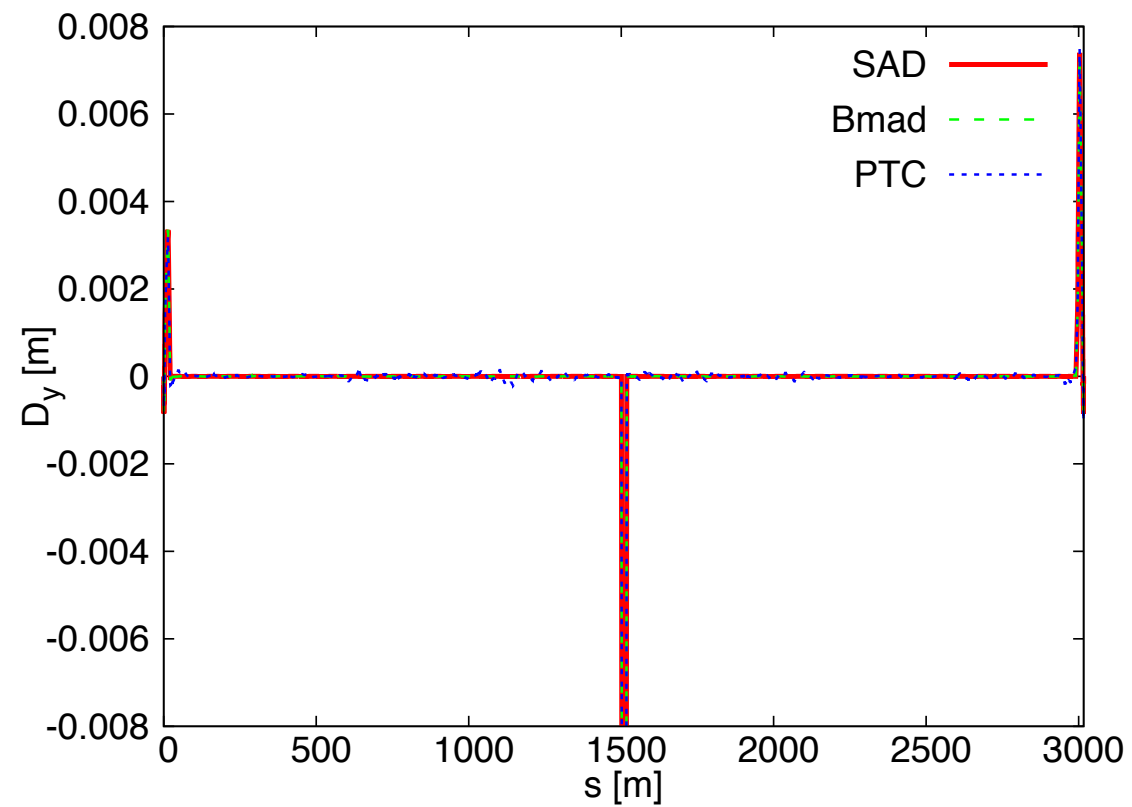
1. Twiss function: Dispersion-X



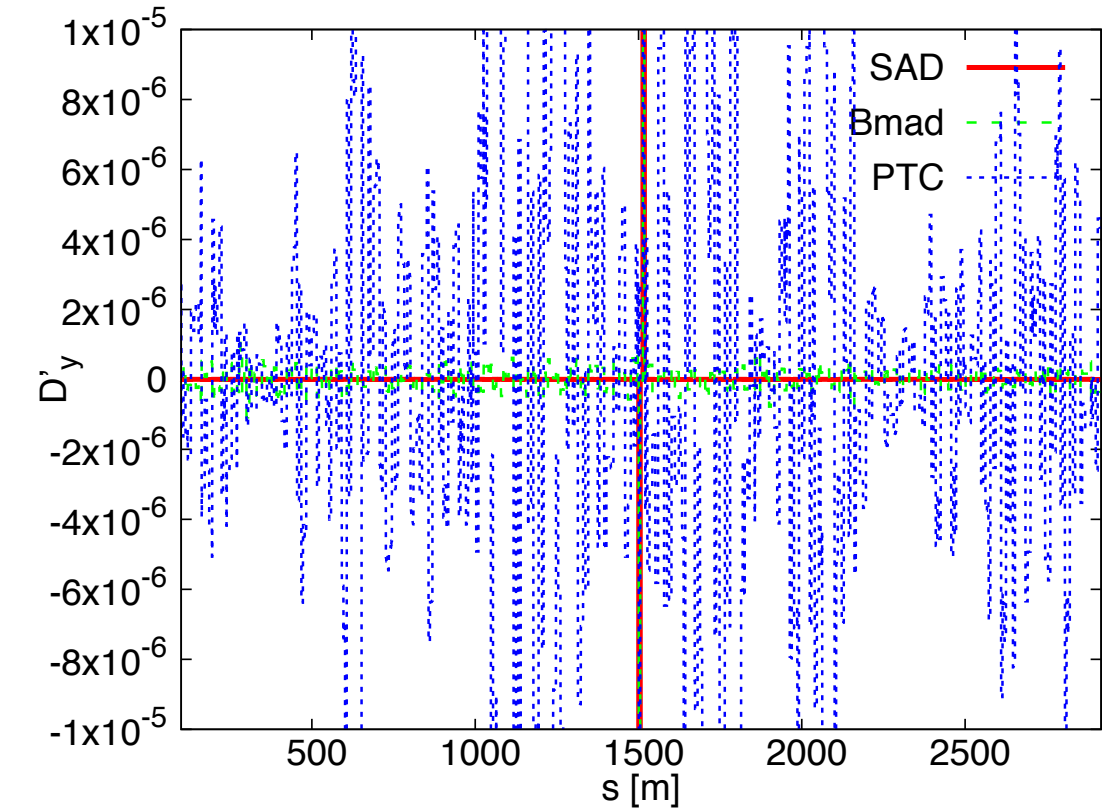
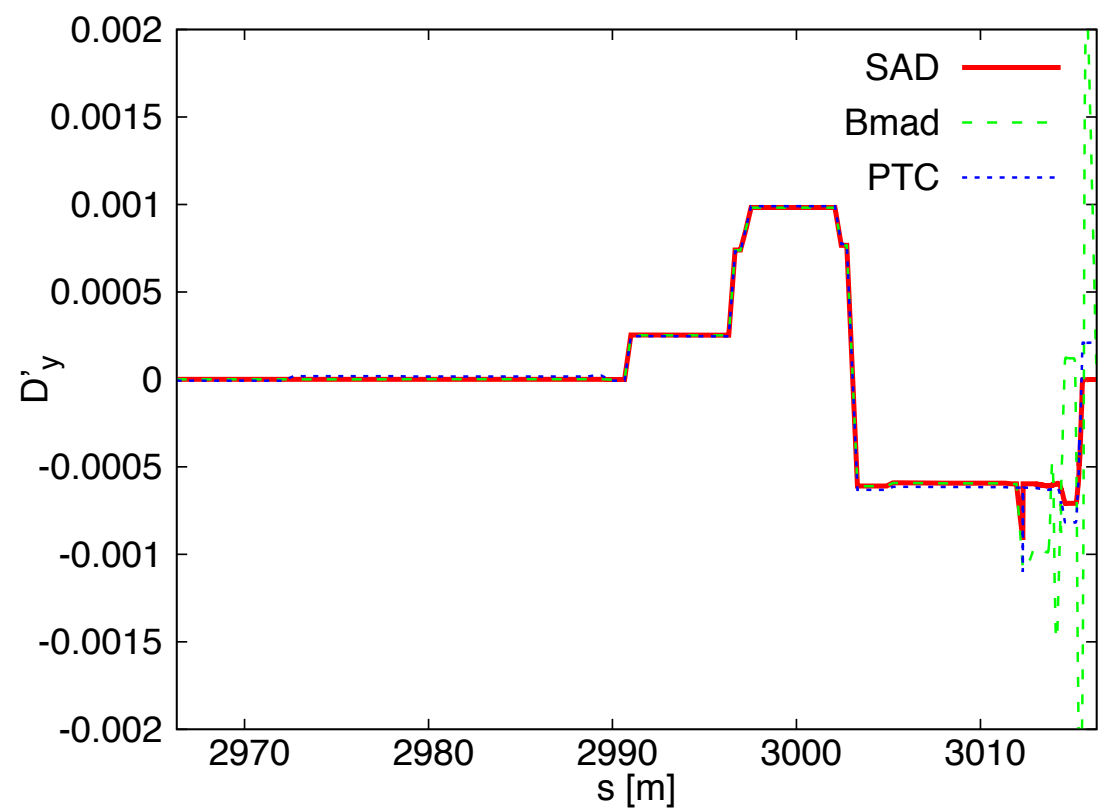
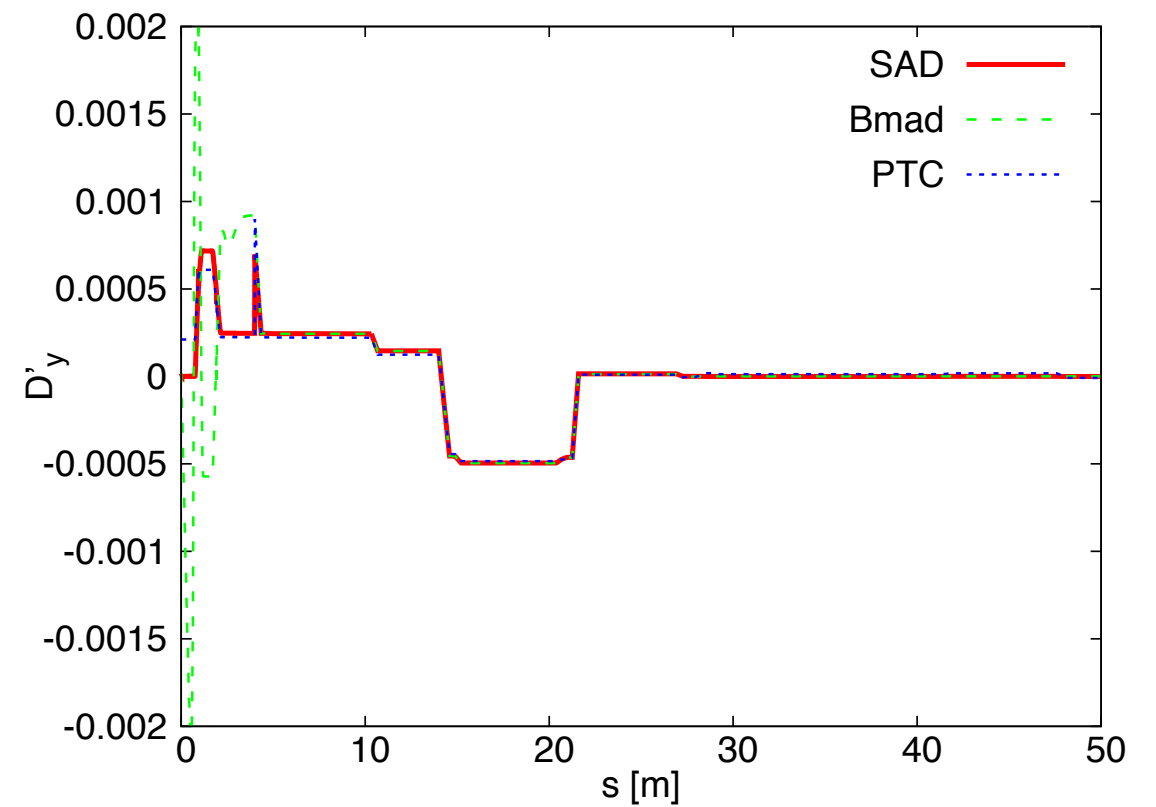
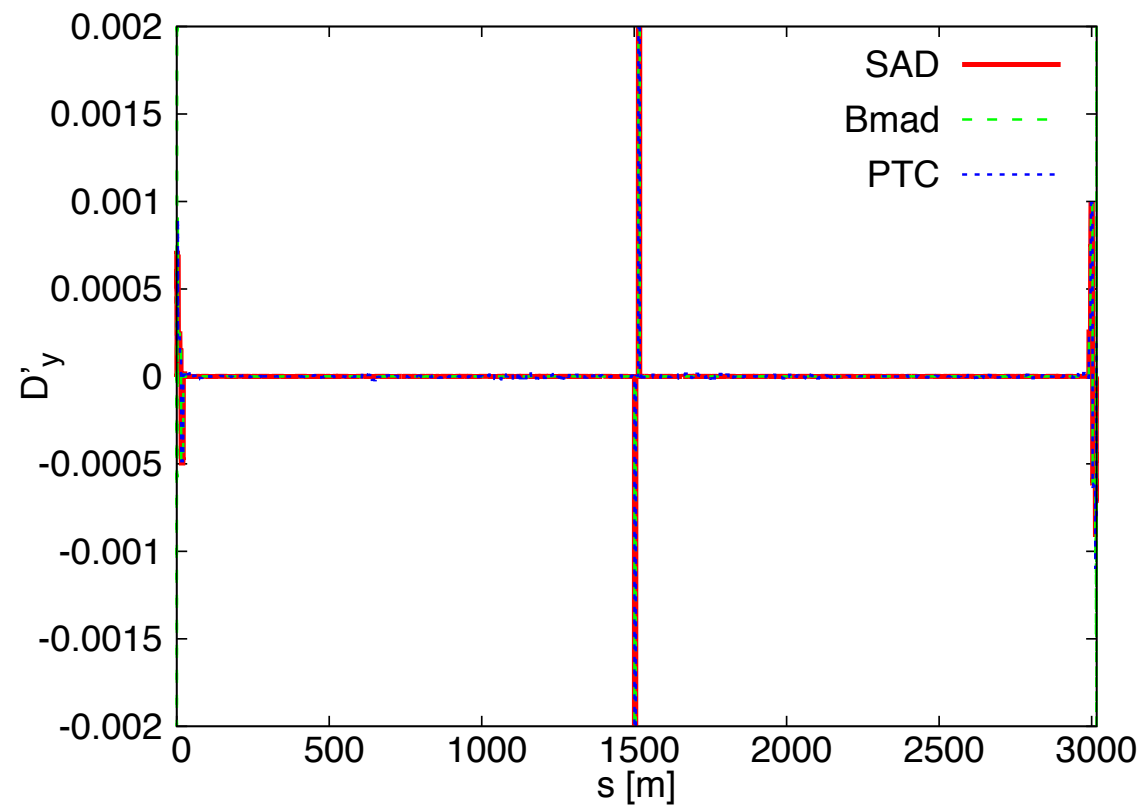
1. Twiss function: Dispersion-X-Prime



1. Twiss function: Dispersion-Y



1. Twiss function: Dispersion-Y-Prime



3. Summary

- In general, now Bmad, SAD and PTC (by E. Forest) are in fairly good agreement**
- The discrepancy of dispersion prime function is due to different definitions of dispersion prime function in Bmad and SAD [Ref. D. Sagan, Bmad manual]**