



Some **quick updates** on neutron BIB

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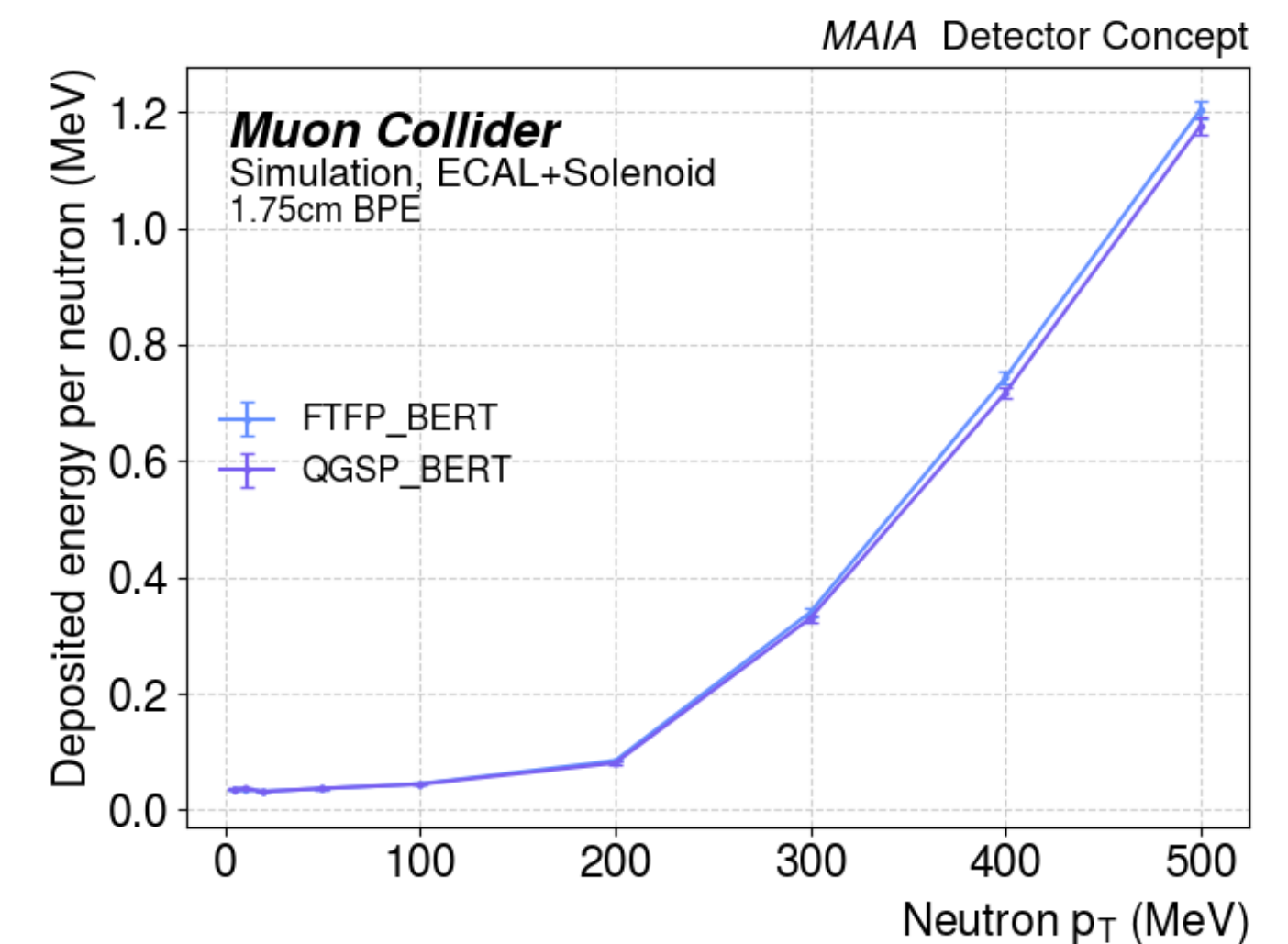
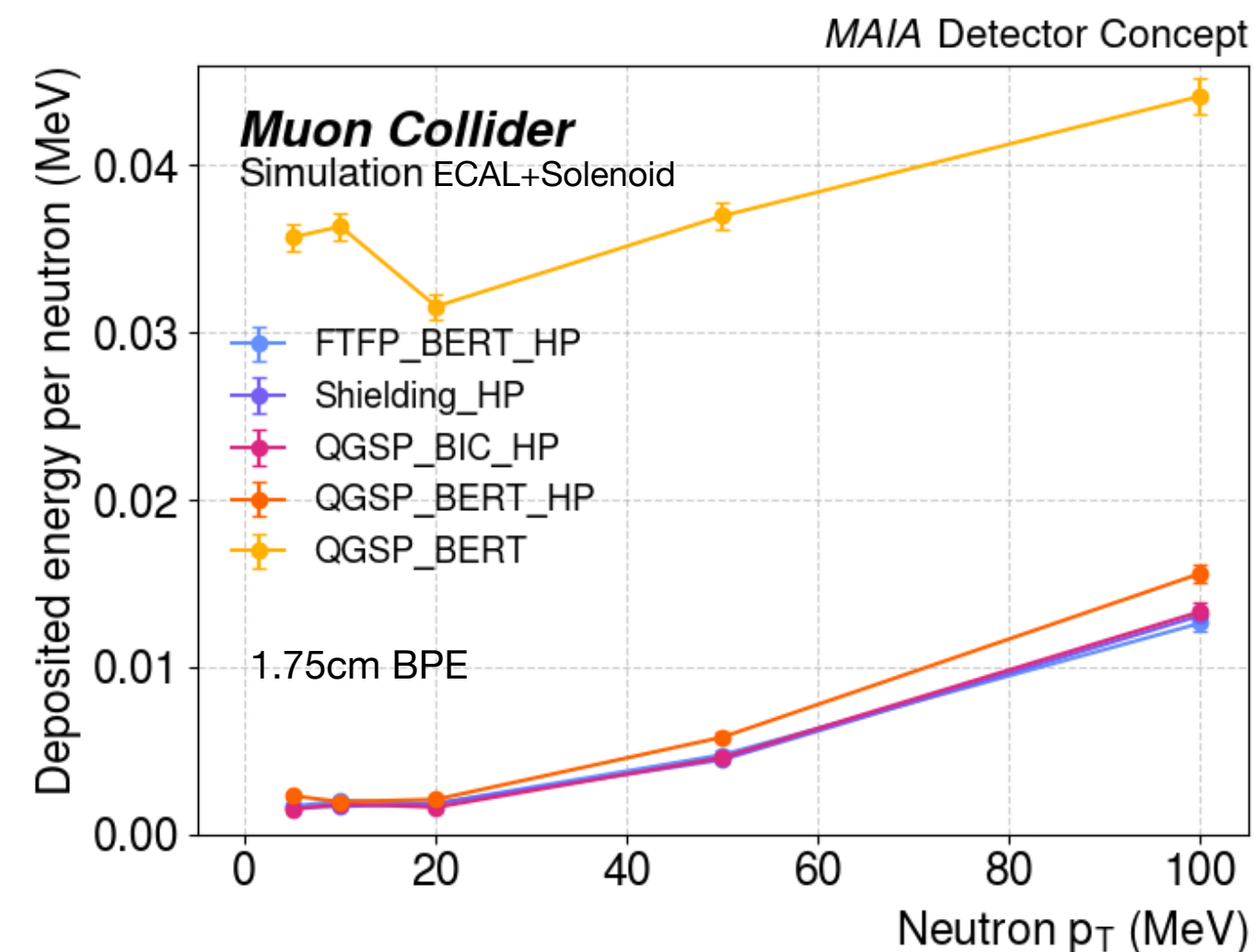
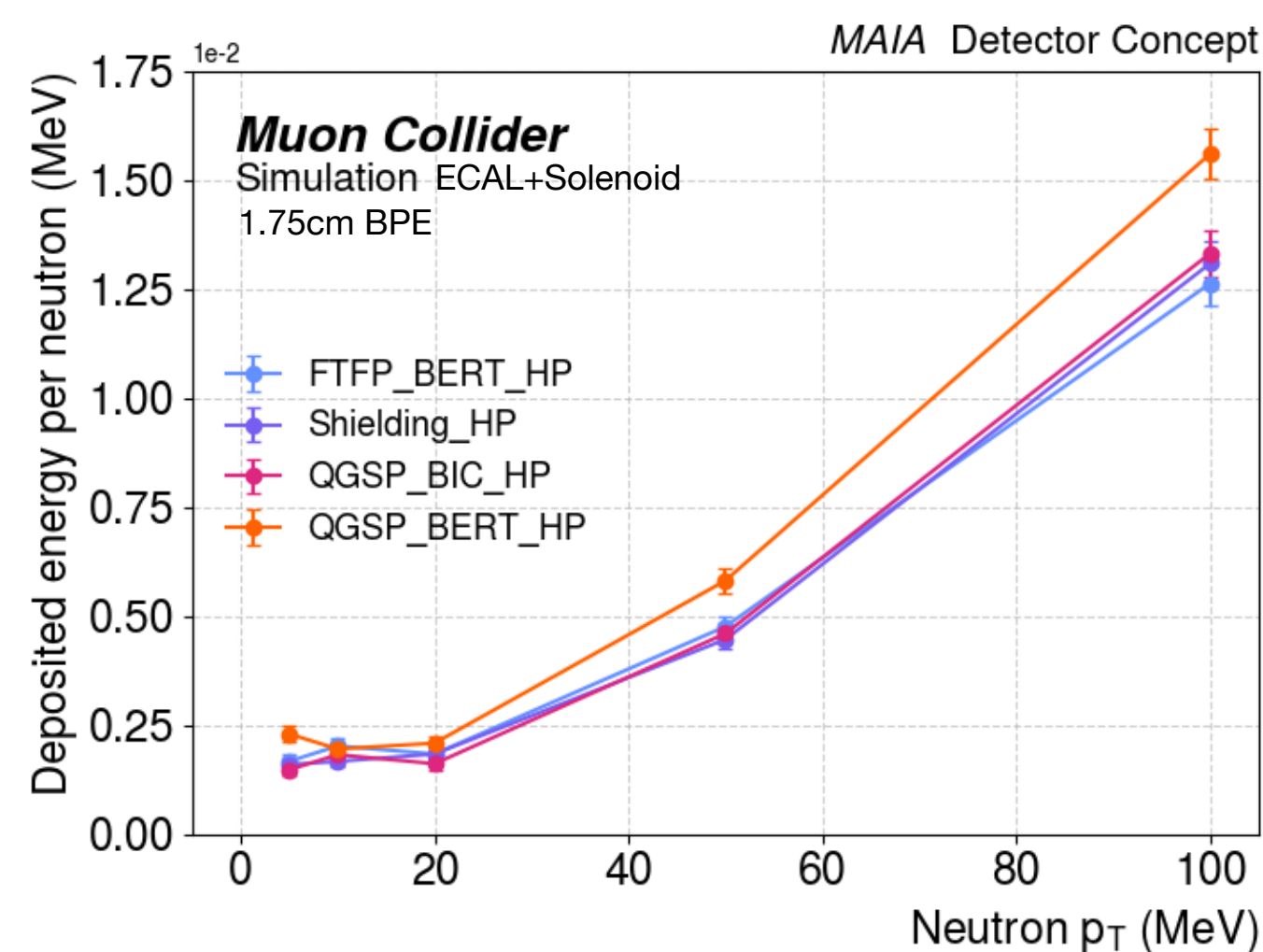


High-precision neutron simulations



A caveat for QGSP_BERT_HP

- Changes made to HP for QGSP_BERT_HP are preliminary as of late '24/early'25 [1]—more mature models should be used
- Lists like FTFP_BERT and Shielding [2] maintain same **cascade model** as QGSP_BERT but have **well-validated** HP versions
- Important point: we haven't shown anything misleading—compared to non-HP, we're on the right track



- Propose to reproduce results shown at USMCC with **FTFP_BERT_HP** since no significant difference in baseline behavior at neutron BIB range
- HPT models add special treatment of **thermal scattering**—relevant for neutron stopping in hydrogenated materials, but only if we dip into this regime

Other things to think about

- Want to understand how computation time will scale up (esp with HPT)—best practices for benchmarking?
- Boron-10 enrichment for shielding → any trade-offs by using $^{10}\text{B}_4\text{C}$?

[1] [Geant4 forum: ncapture cross section in QGSP BERT HP](#)

[2] [Physics List Guide, Rel. 11.3 Sec. 2.3.6](#)