u-Channel: DVCS Feasibility

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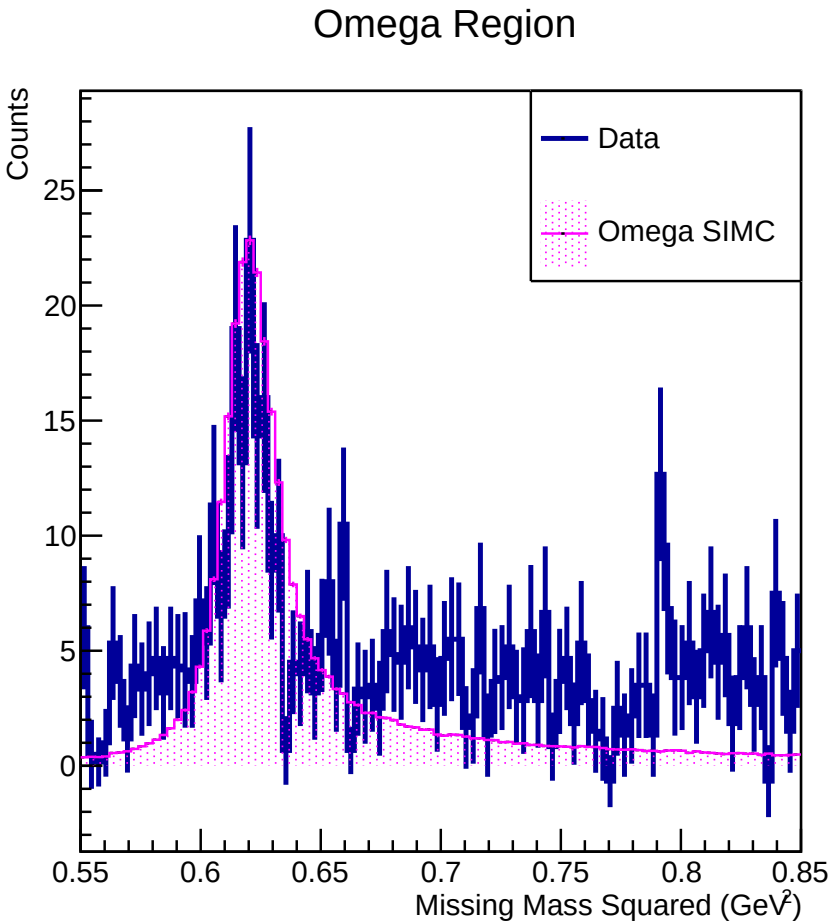
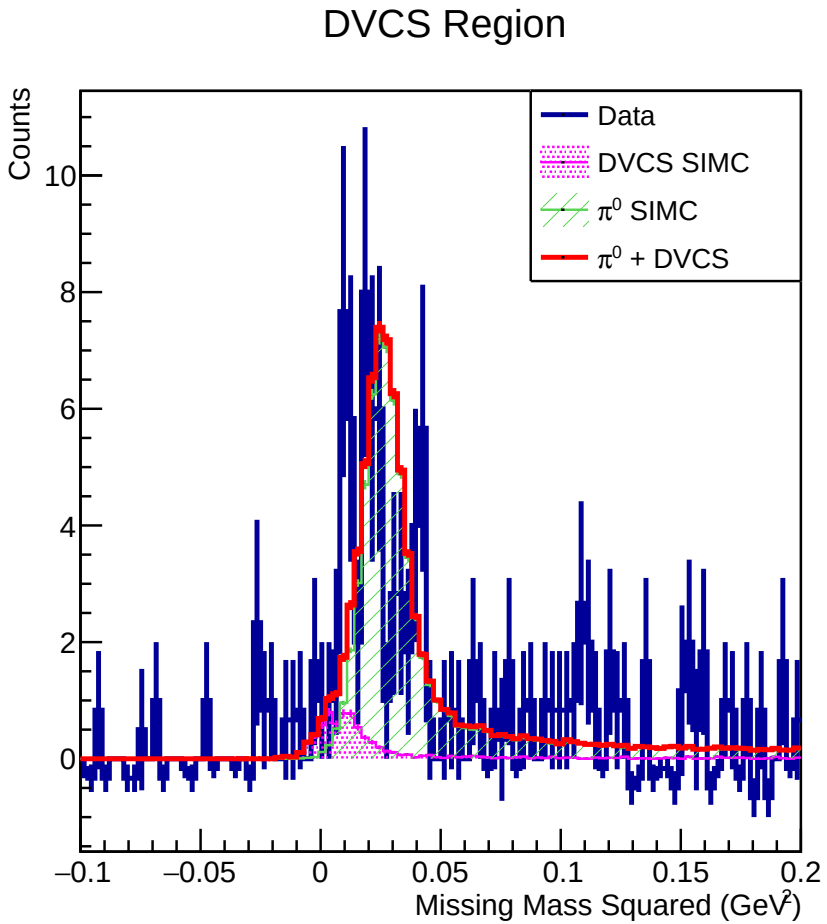
Outline

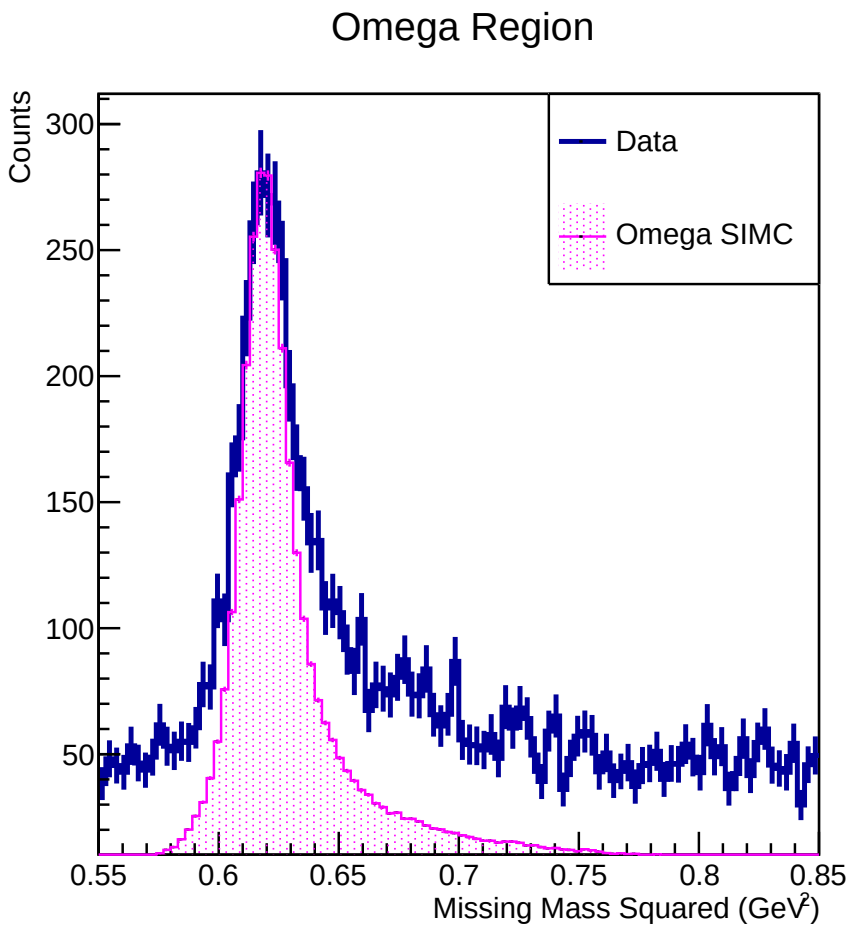
- The following plots show missing mass squared, $m_X^2 = E_{miss}^2 - P_{miss}^2$
- Looking to separate DVCS ($m_X^2 = 0$) and exclusive π^0 production ($m_X^2 = 0.018$)
- Plots have proton PID and random subtraction, no dummy target subtraction
- Ansatz: peak is 90% π^0, 10% DVCS
- Only SHMS center is shown: other angles look similar
- For high ϵ, data is shifted to match the $p\omega^0$ peak, but the shift is not optimized

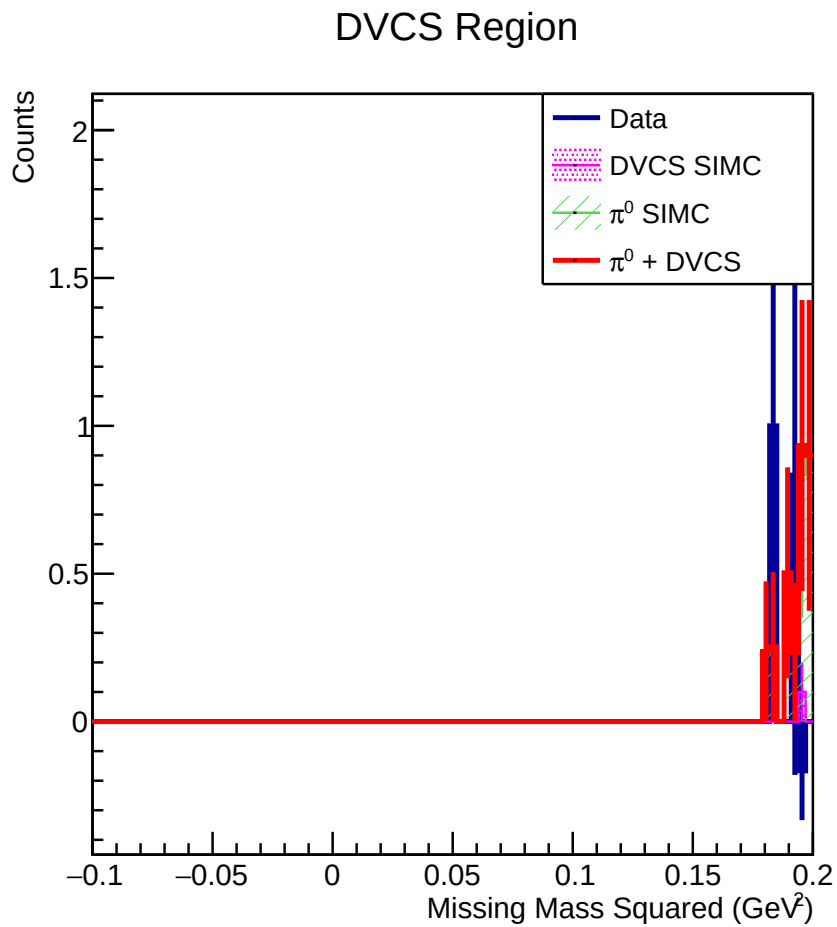
Q^2=2.1, W=2.95, low ϵ



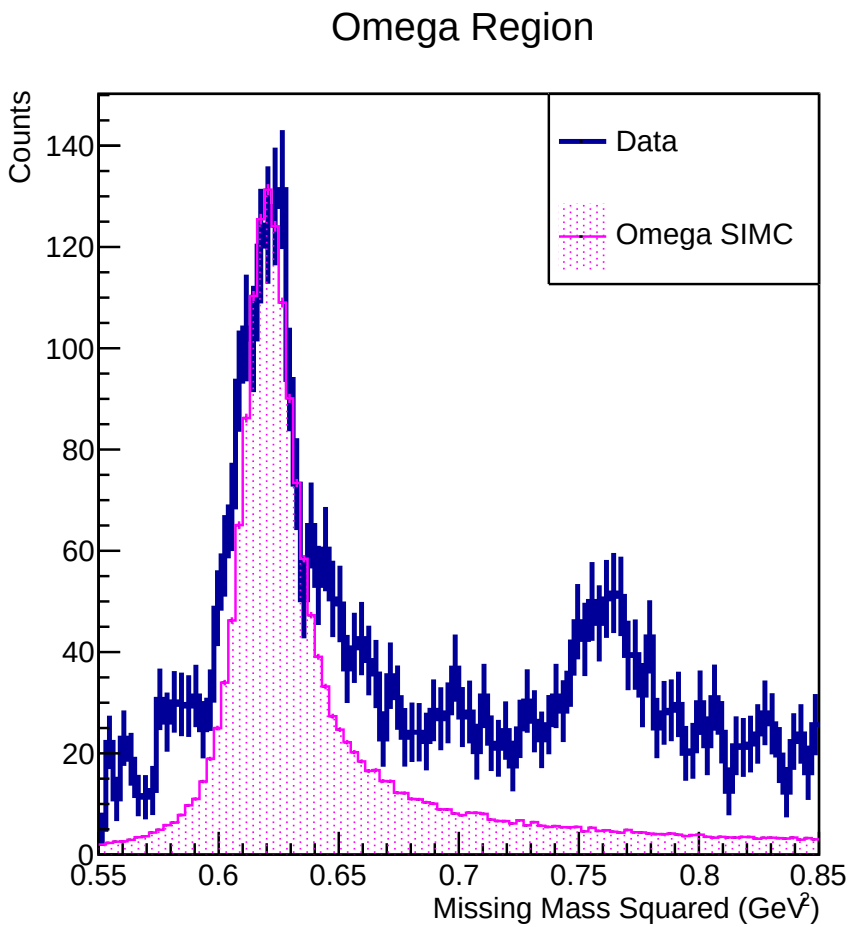


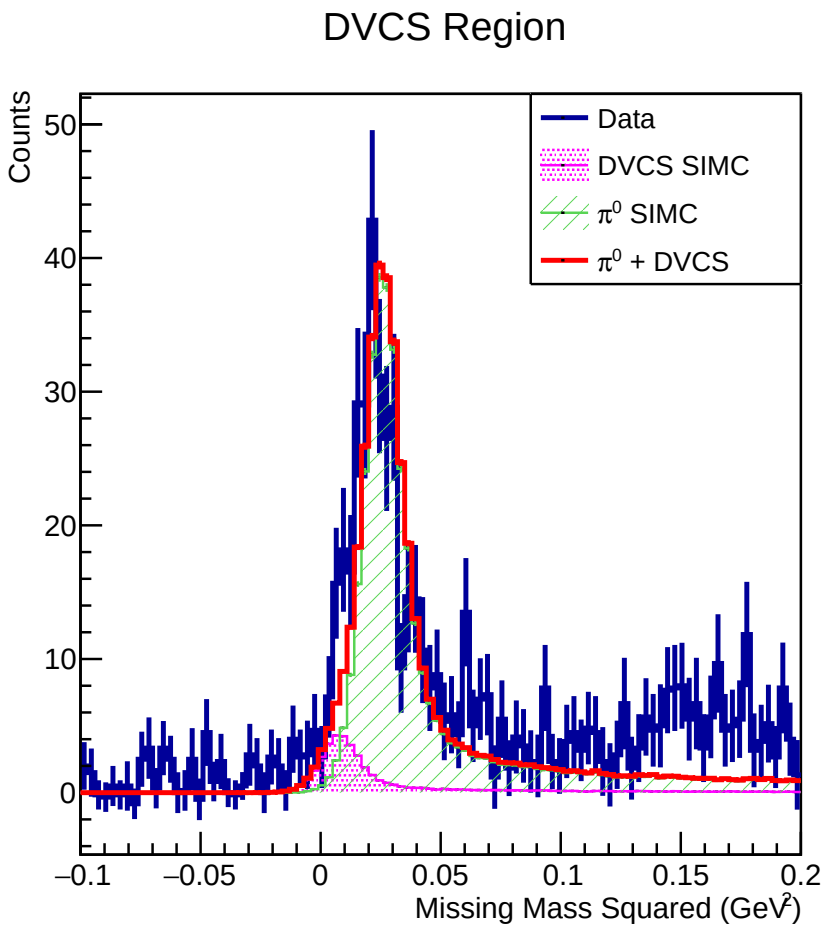
Q^2=3.0, W=2.32, low ϵ





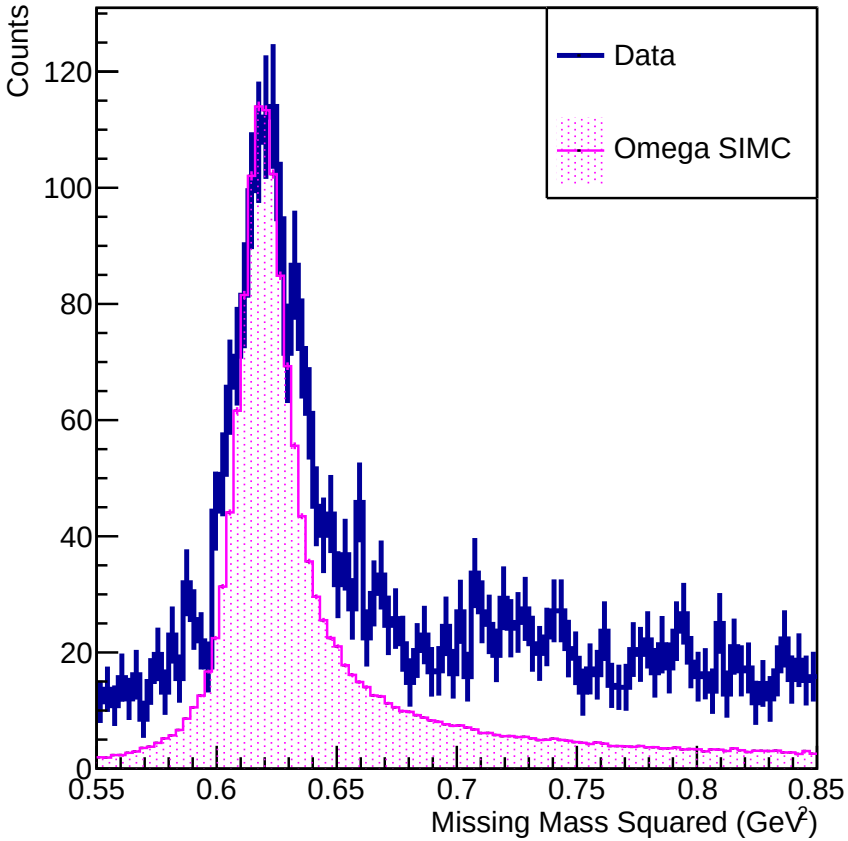
Q^2=3.0, W=3.14, low ϵ



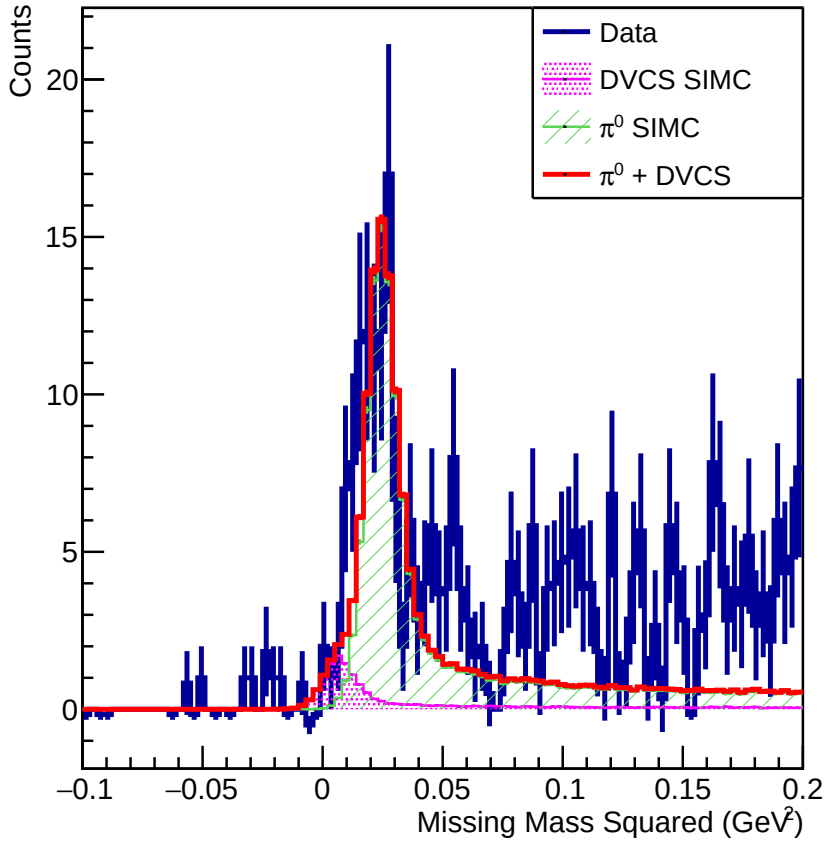


Q^2=4.4, W=2.74, low ϵ

Omega Region

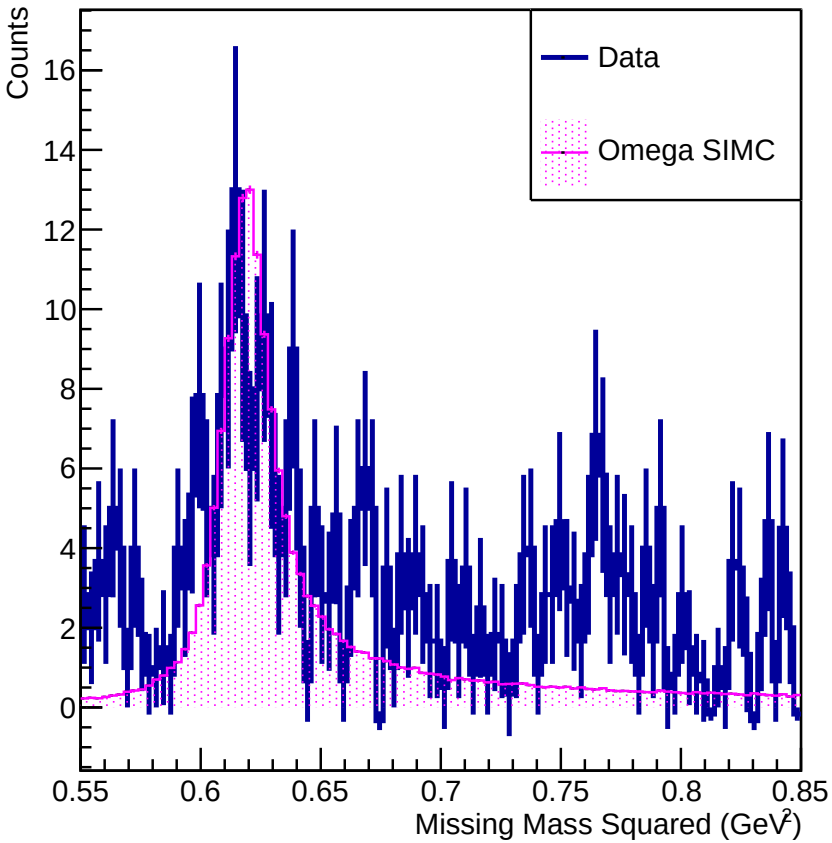


DVCS Region

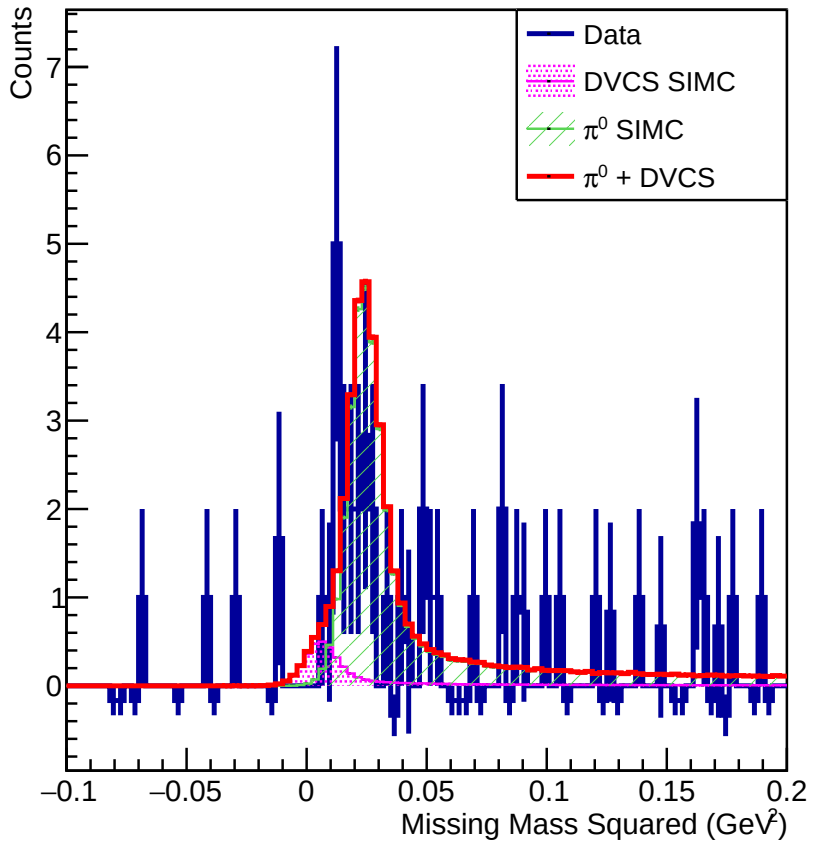


Q^2=5.5, W=3.02, low ϵ

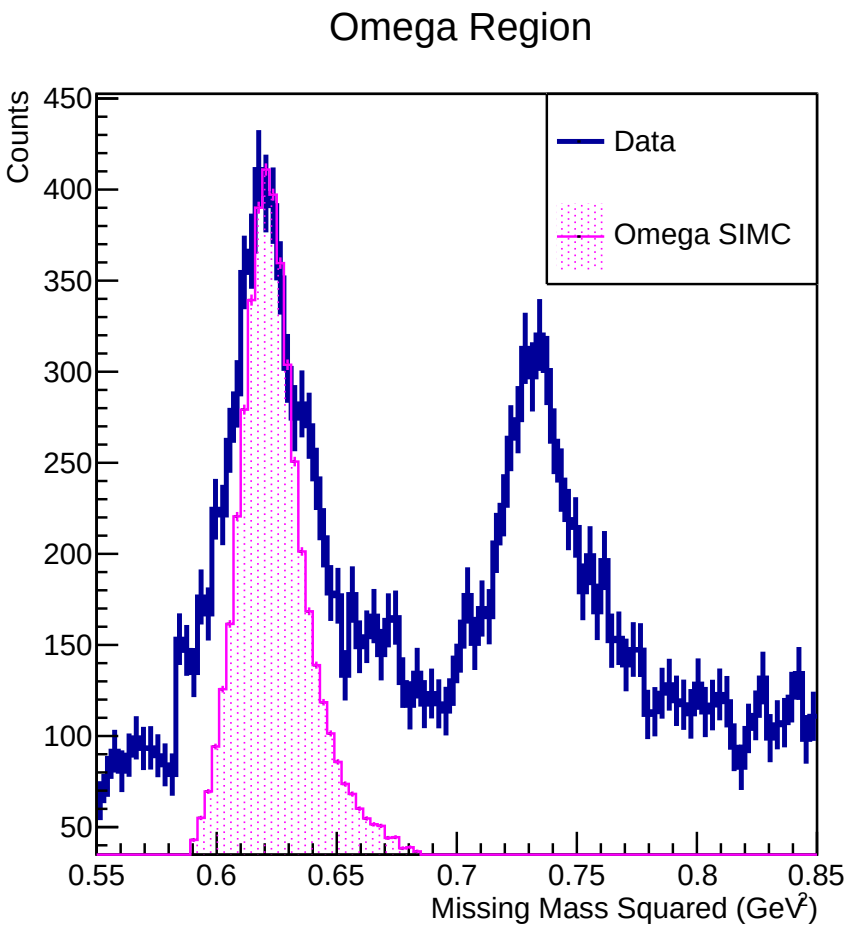
Omega Region

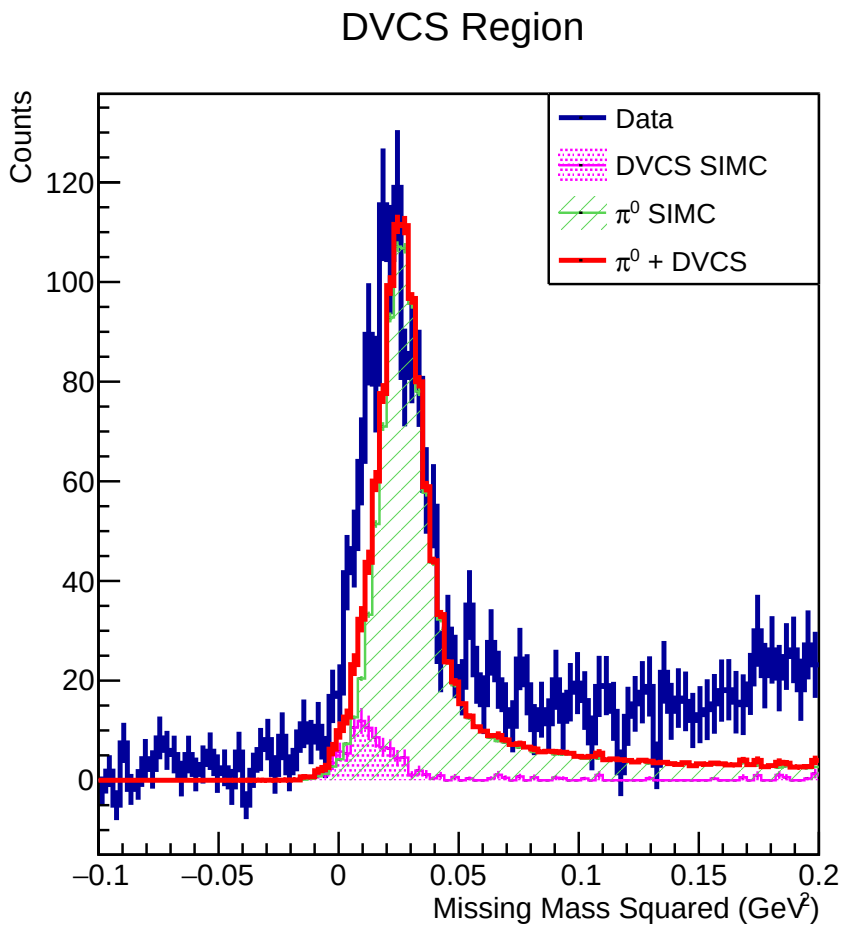


DVCS Region



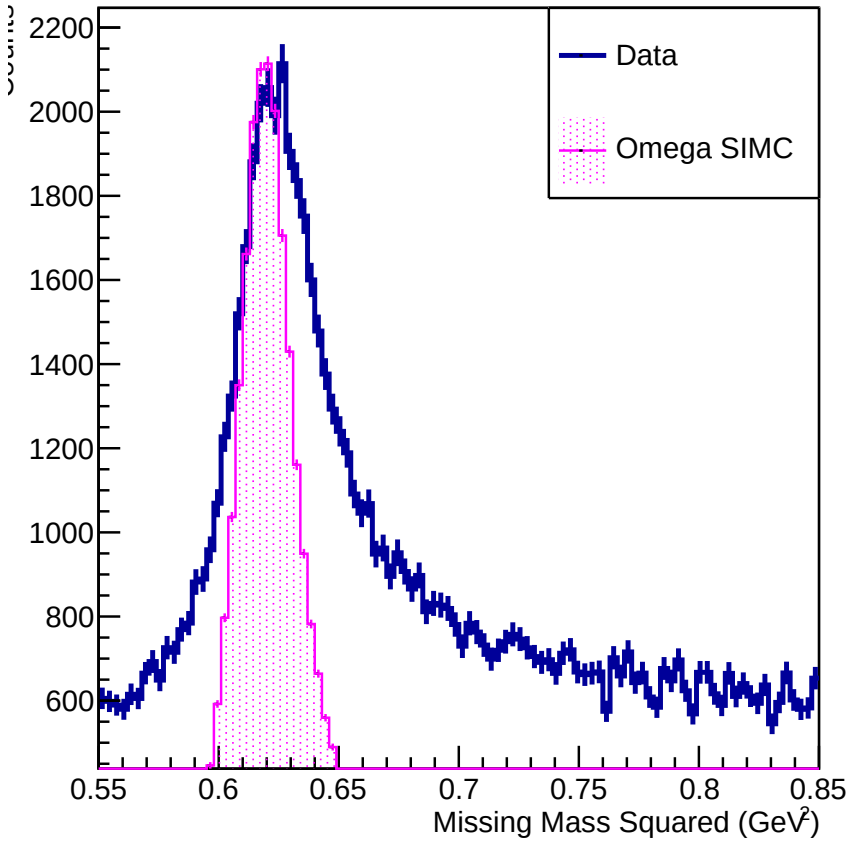
Q^2=2.1, W=2.95, high ϵ





Q^2=3.0, W=2.32, high ϵ

Omega Region



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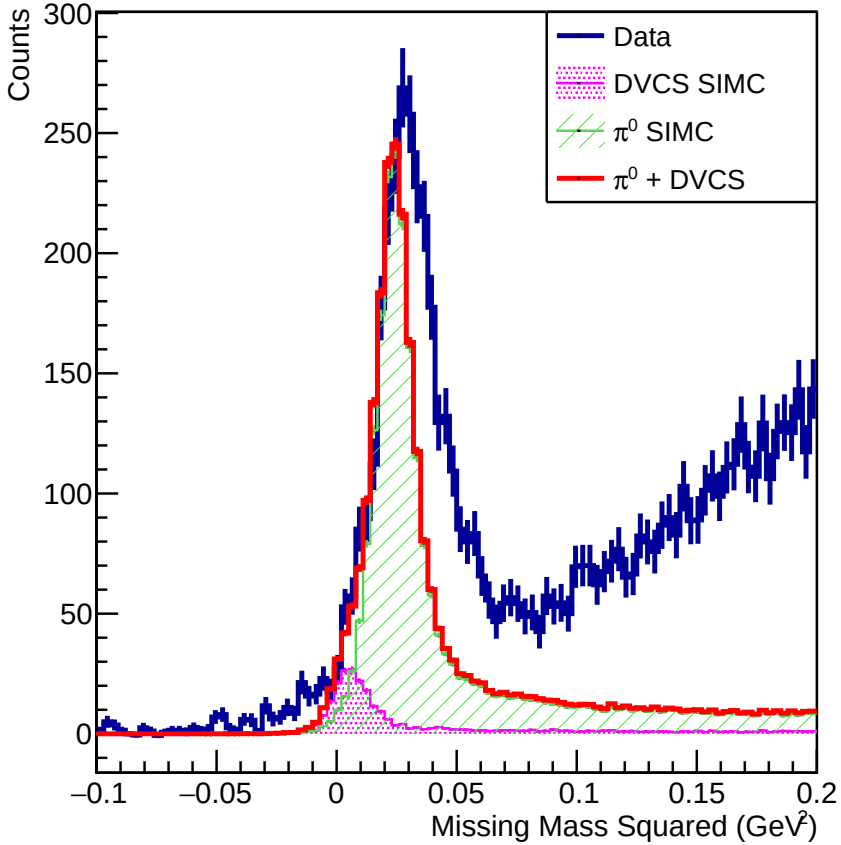
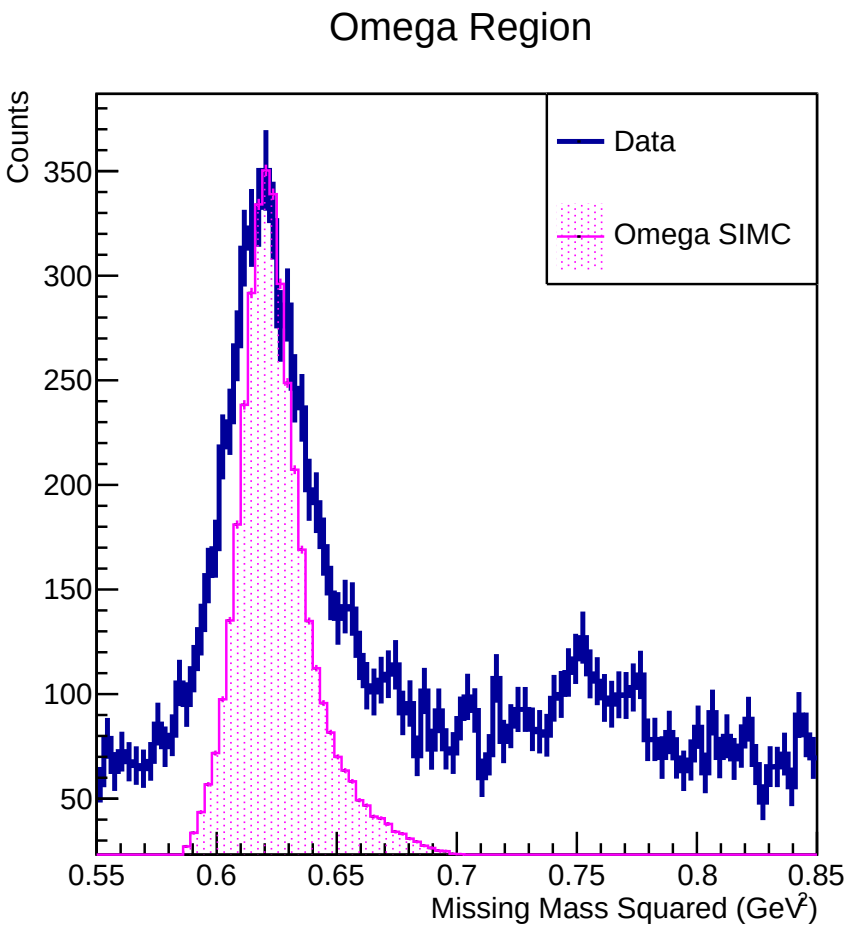
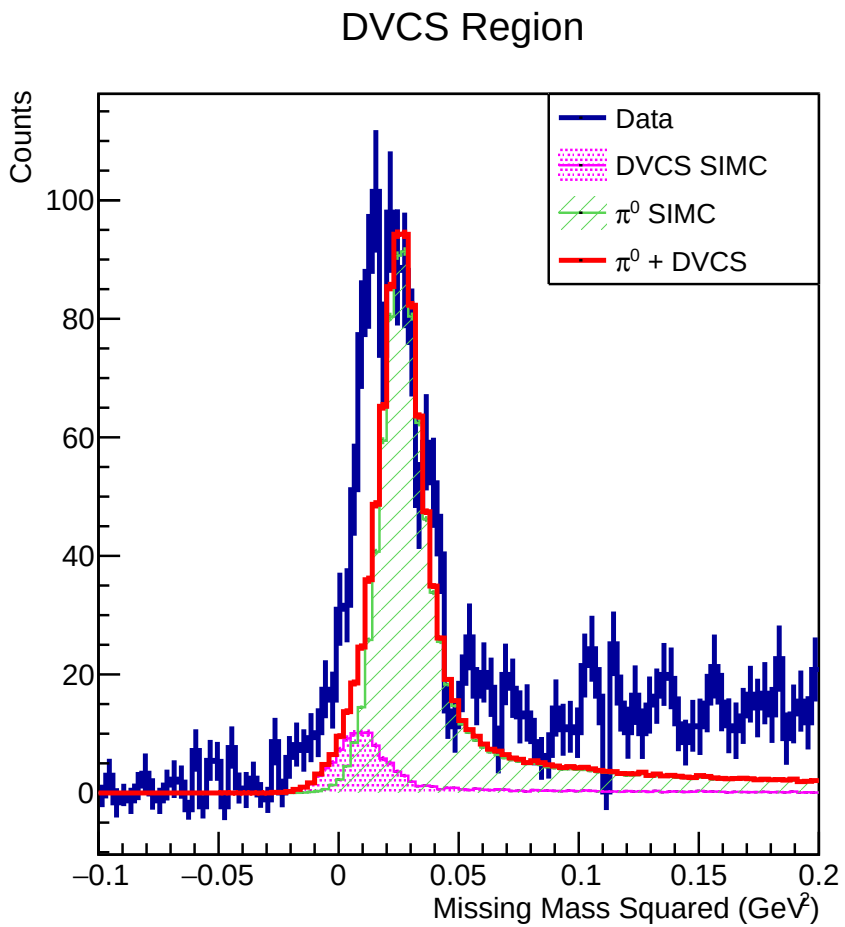


Q^2=3.0, W=3.14, high ϵ





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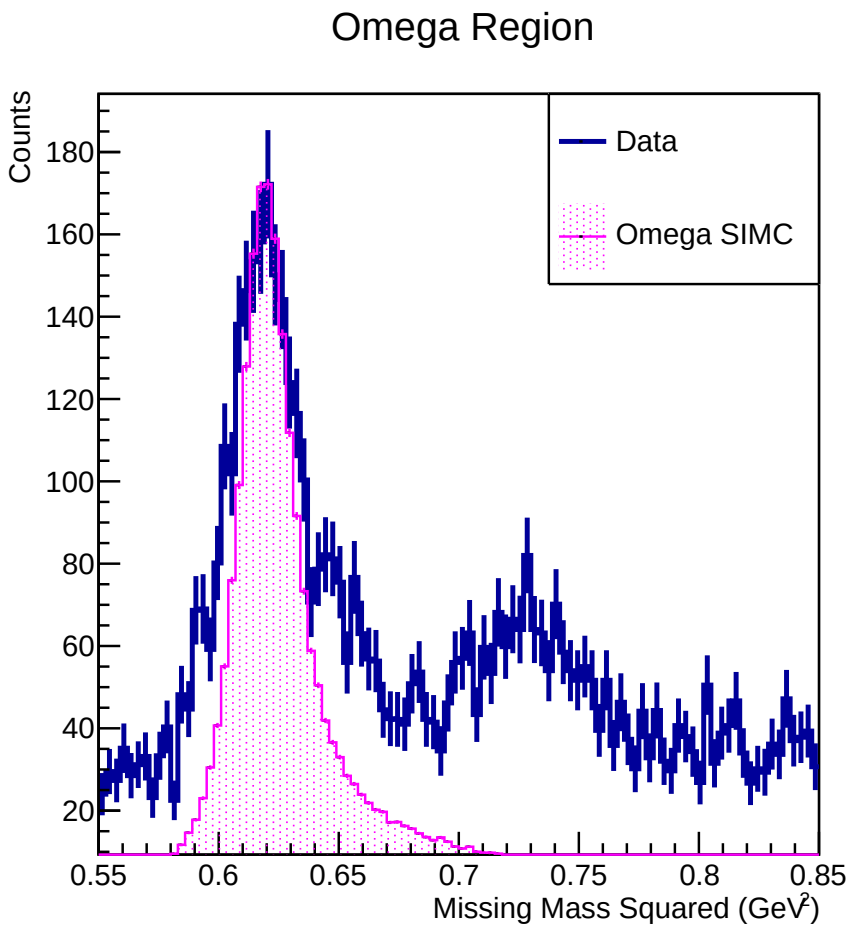
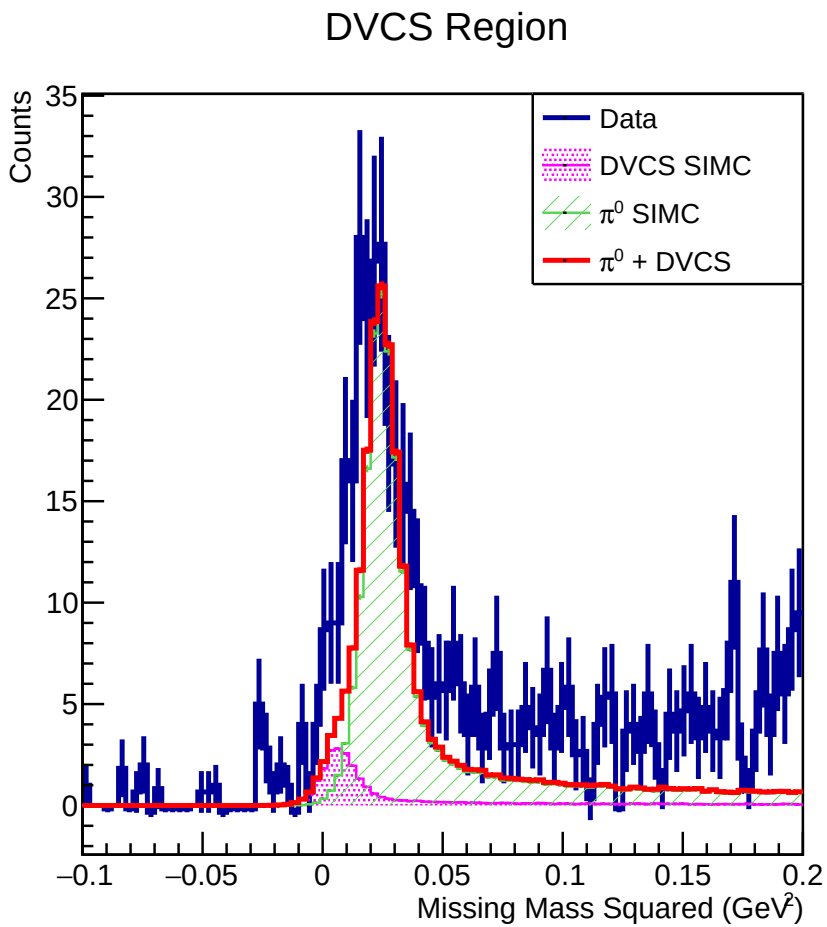
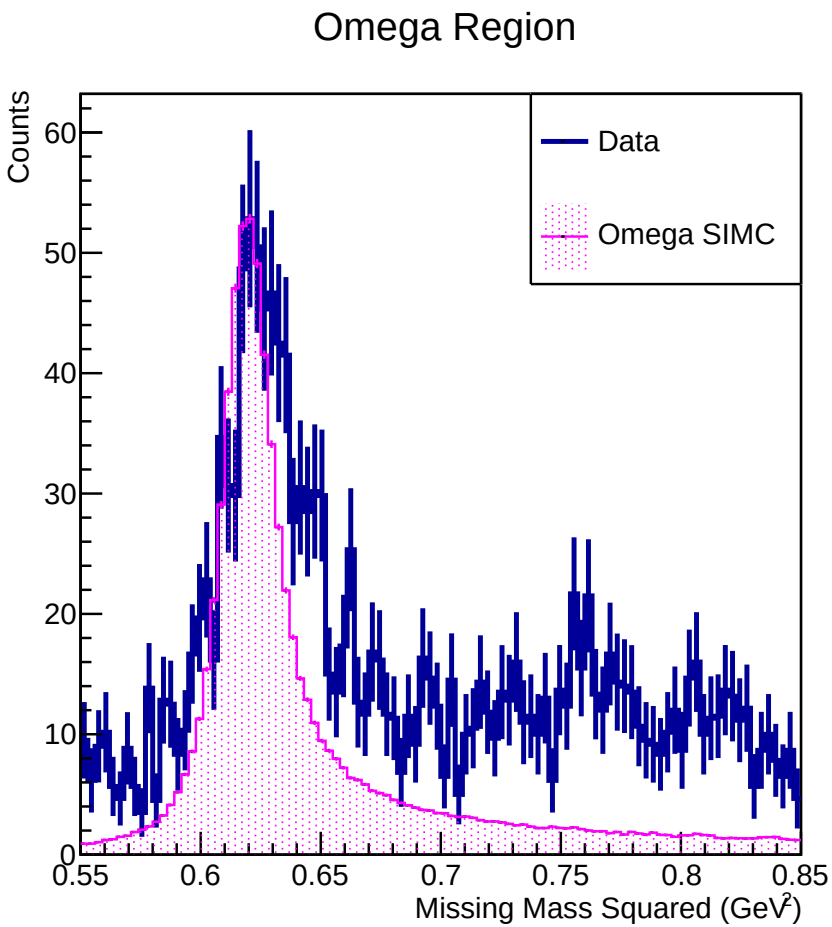
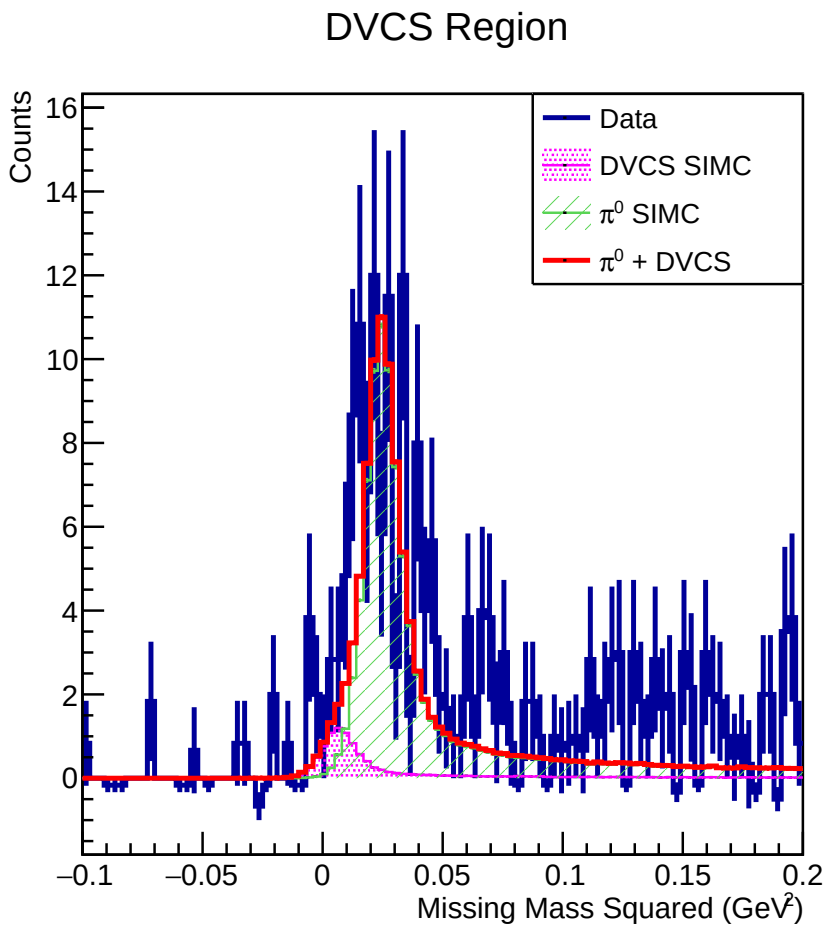




Q^2=5.5, W=3.02, high ϵ





Feasibility

(Q^2,W)	Low ϵ	High ϵ
(2.1,2.95)	× Statistics	✓
(3.0,2.32)	× Off focal plane	✓
(3.0,3.14)	✓	✓
(4.4,2.74)	✓	✓
(5.5,3.02)	× Statistics	?? Statistics

- Q^2=3.0, W=3.14, high ϵ has poor resolution, but given there should be no t-channel data at such low m_X^2, an estimate should still be possible

MMp vs MM squared?

- The setting Q^2=3, W=2.32, high ϵ has poor resolution (and no RF), making it difficult to distinguish pω^0 from π^+n
- Is the difference more visible with m_X^2?
- Not really - separation is larger but so is the width of each peak