



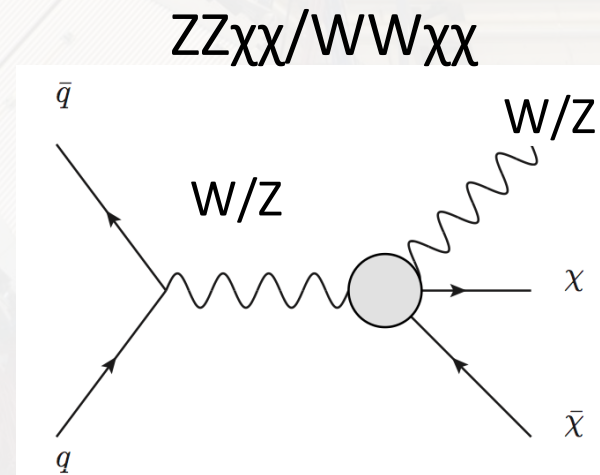
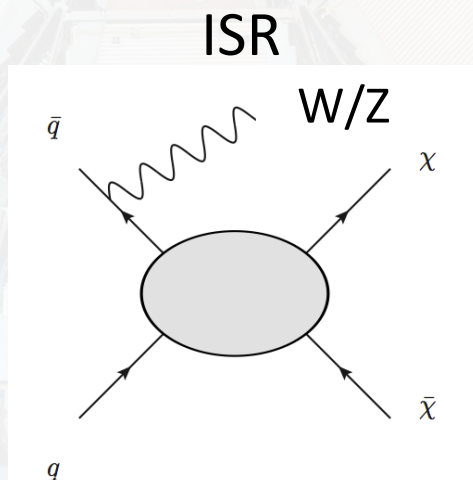
ATLAS Mono-W/Z

Amelia Brennan, U. Melbourne, mono-Z(\rightarrow ll)

Andrew Nelson, UC Irvine, mono-W/Z(\rightarrow jj)

Mono-W/Z Hadronic (A.Nelson)

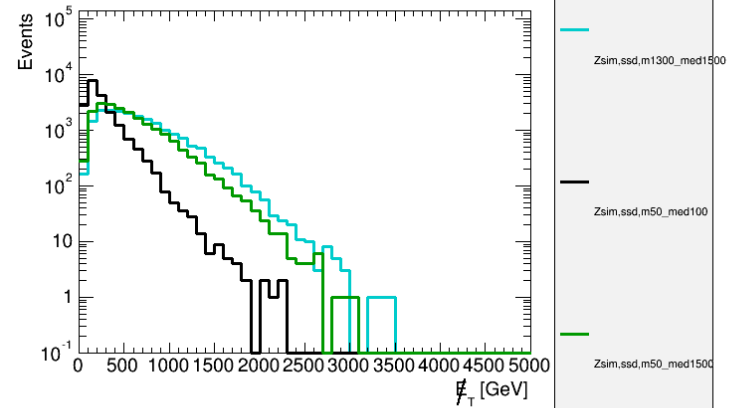
- Started looking at EFTs and simplified models
 - EFTs: standard ISR-type as well as $VV\chi\chi$
 - Simplified Models:
 - s-channel: scalar/pseudo-scalar, vector/axial-vector
 - t-channel: scalar
 - We considered both constructive and destructive interference for the vector simplified models of the mono-W channel
- Simplified models correspond to a UV completion of the ISR-type EFTs, but **we lack a simplified model corresponding to $VV\chi\chi$ -type EFTs**
- Parameters:
 - MadGraph5 (2.2.2)
 - Fermion DM
 - MSTW2008LO
 - Default MG scales



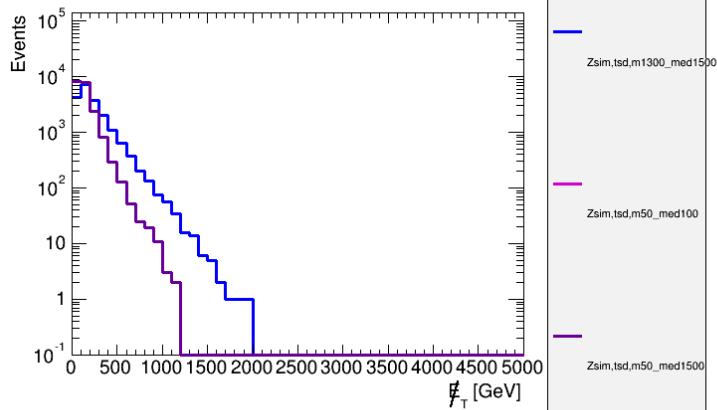
Mono-Z(->jj)

- MET plots are shown for some selected simplified models
- s-channel: scalar & vector
- t-channel: scalar

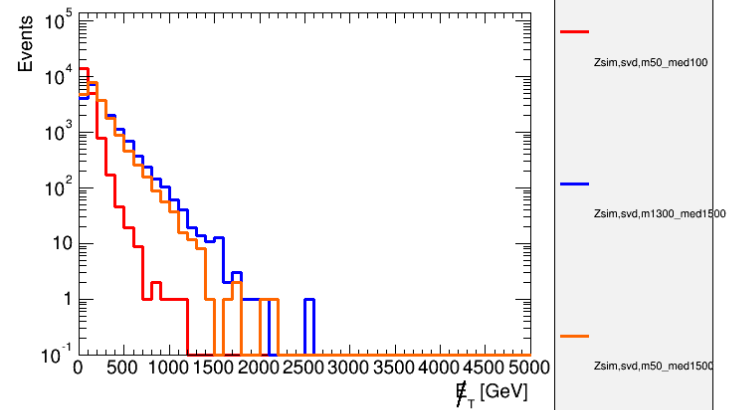
s-channel:
scalar



t-channel:
scalar



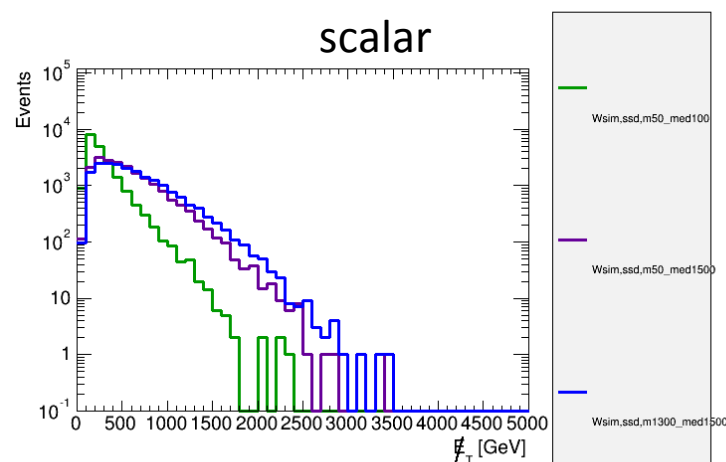
s-channel
vector



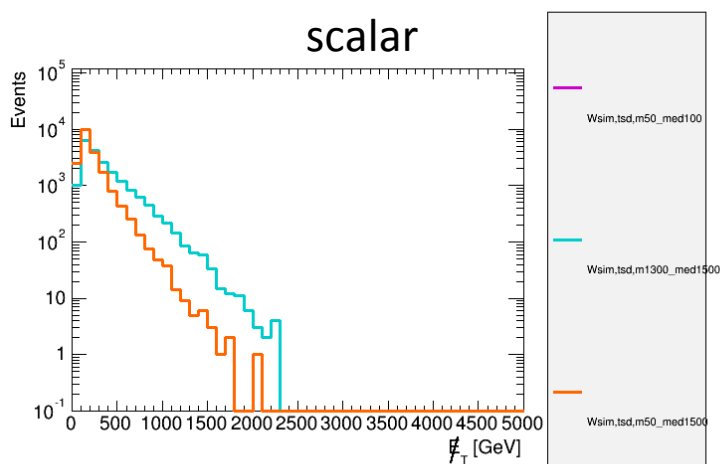
Mono-W(->jj)

- MET plots are shown for some selected simplified models
- s-channel: scalar & vector
- t-channel: scalar

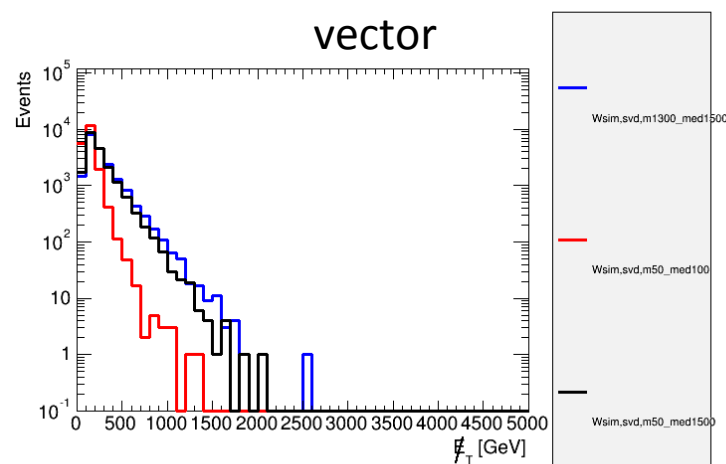
s-channel:
scalar



t-channel:
scalar

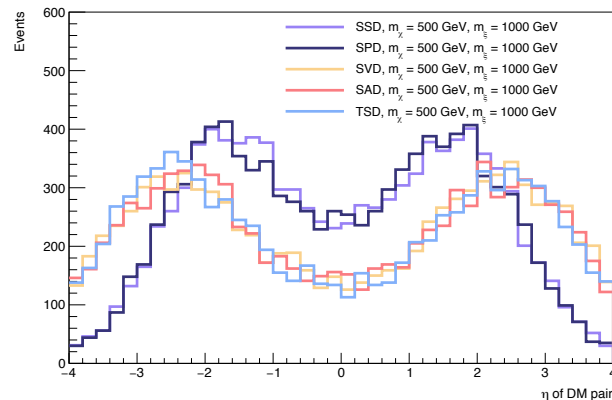
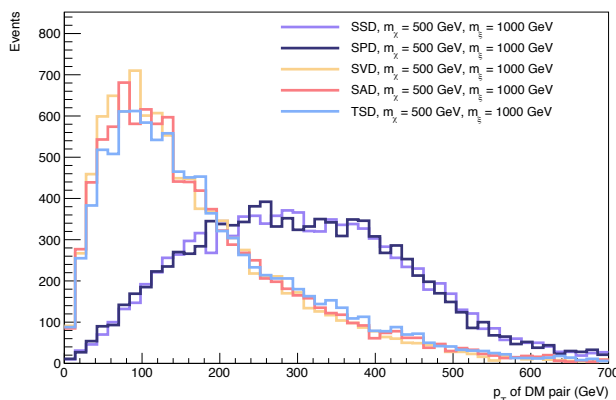
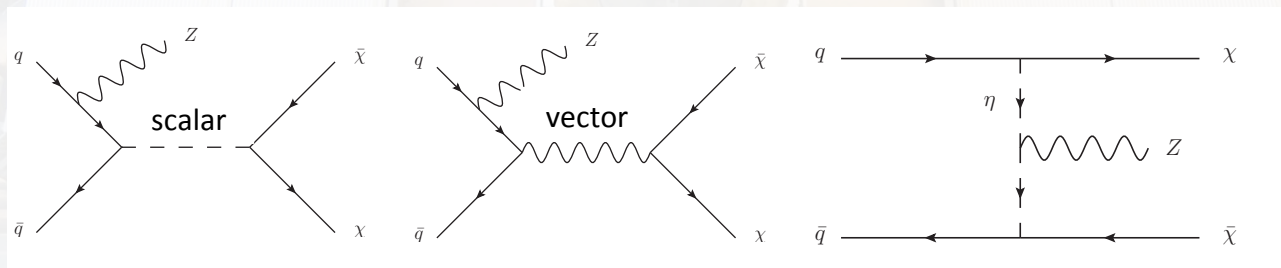


s-channel
vector



Mono-Z Leptonic (A. Brennan)

- Note: Current state of flux as merging with Higgs group ($ZH \rightarrow \ell\ell + \text{inv}$), expect to do DM interpretation in later stage of analysis
- Same models as the mono-W/Z hadronic analysis
 - In particular,
 - s-channel: scalar (pseudo-scalar), vector (axial-vector)
 - t-channel: scalar

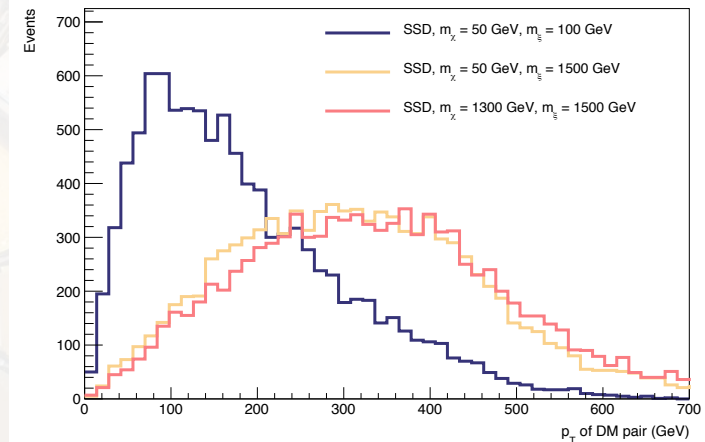


- 5 models at MadGraph level
 - pseudo-scalar, axial-vector unnecessary beyond this

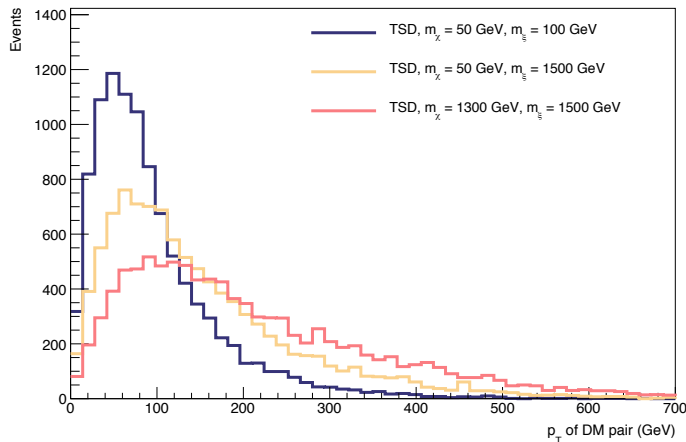
Mono-Z(->II)

- Truth MET plots are shown for some selected simplified models
- s-channel: scalar & vector
- t-channel: scalar

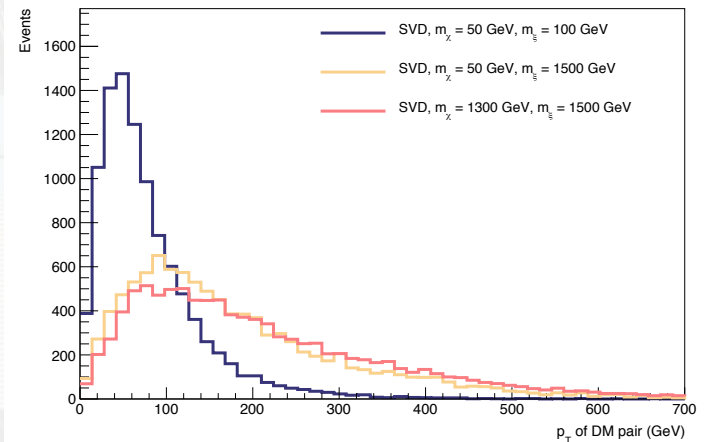
s-channel:
scalar



t-channel:
scalar



s-channel
vector



General comments

- Cross-comparing with other mono-X groups is good
 - Have adjusted masses for preliminary samples for consistency between mono-W/Z (had) and mono-Z (lep) already
- Need to agree on approach to widths
 - Minimum width should be defined and included
 - Do we keep $M/3$ and $M/8\pi$? Good as a standard, but realistic?
- What about coupling strength? s-channel models have independent g_q, g_χ , so far $g_q = g_\chi$ is common, easier for plotting limits, but what about a small set of alternatives [$(g_q \text{ max}, g_\chi \text{ min})$, vice versa, $(g_q = 2g_\chi)$, etc]?