



中国科学院高能物理研究所
Institute of High Energy Physics
Chinese Academy of Sciences



Weekly update

Abdualazem Fadol

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Status of the $4\ell + E_T^{\text{miss}}$ analysis

Table 5: Cut-flow for the raw events at the preselection for the $R \rightarrow SH \rightarrow 4\ell + E_T^{\text{miss}}$ signal with $(m_R, m_H) = (390, 220)$ GeV mass point. The events are shown for the $4\mu, 4e, 2\mu 2e, 2e2\mu$ and 4ℓ channels using mc16a, mc16d and mc16c.

	4μ	$4e$	$2\mu 2e$	$2e2\mu$	4ℓ
All events	140000	140000	140000	140000	140000
Preselection	34843	34960	37691	31911	139419
Lepton selection	25859	16366	21618	19474	83320
SFOS	25670	15654	21062	18995	81384
Kinematic cuts	25652	15644	21051	18980	81330
m_{Z_1}	25630	17620	21037	18954	81259
m_{Z_2}	24597	15635	20744	18642	78911
J/ψ Veto	24490	14907	20743	18642	78785
ΔR	24420	14906	20649	18551	78529
Isolation	21792	13594	18746	16487	70622
Impact parameter	21280	13509	18389	16218	69399
Vertex selection	21212	13482	18366	16180	69243
Trigger	21153	13479	18343	16162	69140
Final selection	21153	13479	18343	16162	69140

- The sequential problem with the cut-flow is fixed, and the note is updated accordingly with the correct cut-flow. Thanks to RD for helping out :-)
- This was supposed to be the last missing item for the unblinding \Rightarrow
- **Target:** We want to see the analysis public for Moriond. Therefore, we need a good plan on how to proceed with the interpretations/physics results and have a strong result in the paper. The public results deadlines are a bit tight, see [here](#), so we need to work faster and harder.

- Validation plots for new samples generation: samples with large width approximation for A and H widths.
 - $A \rightarrow Z(\rightarrow X)H(\rightarrow 4\ell)$ (done)
 - $A \rightarrow Z(\rightarrow 2\ell)H(\rightarrow 2\ell + X)$ (in progress)
- The note is updated with the CKKW and QSF uncertainties results showed last week.

HBSM convenors

- We discussed with the HDBS convenors how to proceed with the unblinding. The production of new samples will require some time, and the convenors are worried that if the analysis is sensitive to a larger width, the analysis strategy might be affected.
- The convenors would like to organise a meeting, this Tuesday 13h-14h, with experts (Nikos and Jana) to discuss which models/widths are of interest for the interpretations and what we can do without too much effort (larger MC request).