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

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Study the effect of LW on the upper limit

Using the $A \rightarrow ZH \rightarrow 4\ell + X$ signal

- We selected $(m_A, m_H) = (320, 220)$ and $(1190, 600)$ GeV mass points for each of the $A \rightarrow Z(\rightarrow X)H(\rightarrow 4\ell)$ and $A \rightarrow Z(\rightarrow 2\ell)H(\rightarrow 2\ell + X)$ signal models to be generated.
- The widths for the A and H are as follows:
 - A widths: 30% and 15%
 - H widths: 10% and 5%
- **Summary:**

the upper limit decreases as the natural width of the A and H bosons increases. A $A \rightarrow ZH \rightarrow 4\ell + X$ signal produced A and H bosons with natural width of 15% and 5% (30% and 10%), respectively, of their experiment mass resolution has upper limit reduced by a factor 1.7 (1.9) from the narrow width case.