$hh \to WW^*WW^*$ 2LSS

Check on limits

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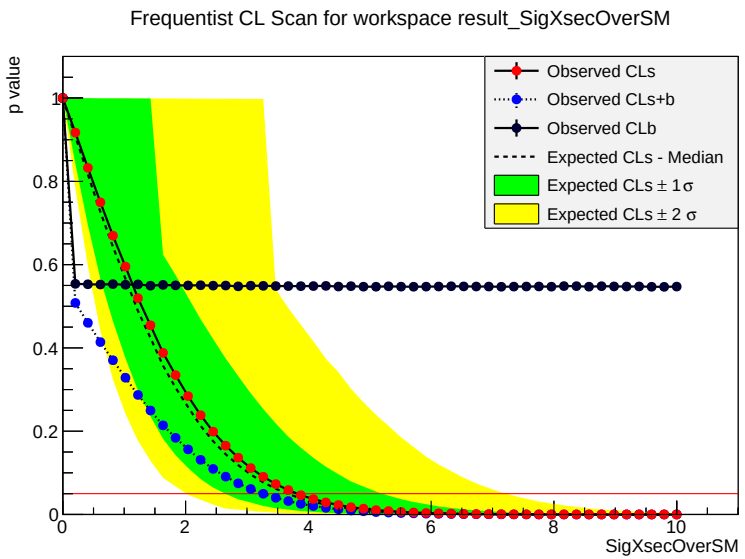
Double check expected limits using toys - I

- The checks are done on two mass points: m_χ=500 GeV(lowest stat. for bkg) and m_χ=340 GeV, m_S=165 GeV(best limit)
- m_χ=500 GeV: POI scan region(0,10) with npoints=50, 500k toys for each POI point.

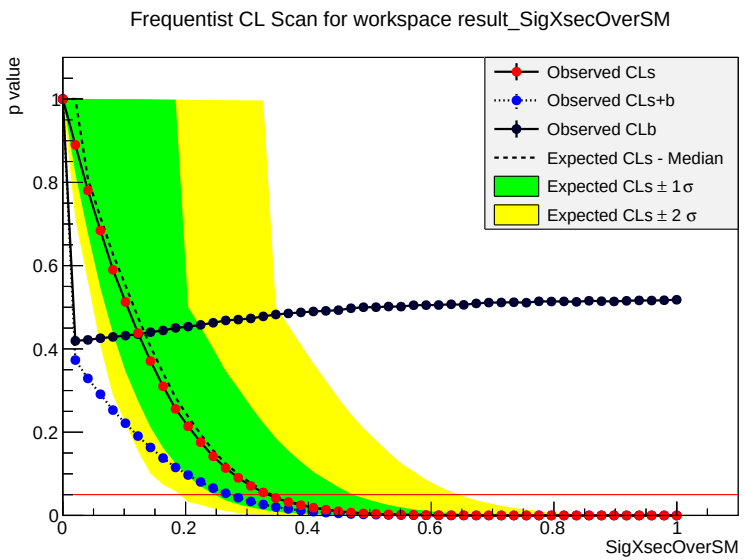
	Median	$+2\sigma$	$+1\sigma$	-1σ	-2σ
Asympototic	3.59	7.23	5.12	2.59	1.93
Toys	3.66	7.22	5.21	2.64	2.02



Double check expected limits using toys - II

- m_X=340 GeV, m_S=165 GeV: POI scan region(0,1) with npoints=50, 340k toys for each POI point.

	Median	$+2\sigma$	$+1\sigma$	-1σ	-2σ
Asympototic	0.33	0.63	0.47	0.24	0.18
Toys	0.34	0.64	0.47	0.25	0.19



Summary

- Two methods result in very close expected limits, with difference restricted in 5%(with respect to asymptotic).

Back up

The distributions of toys at one POI point

Left: m_X=500 GeV, right: m_X=340 GeV, m_S=165 GeV