Unblinding SR: m_T Fit

B-only fit:
- 5-param
- [1500, 6000] GeV
- Initial parameters (IP): from pre-fit

Fit status == 0 or 1
AND
p-value > 0.001?
$S_{spur} < 0.5\sigma$ AND
$S_{fit} - S_{inj} < 0.5\sigma_{fit}$?

y → Fit success
→ S+B interpretation

n ↓

1. Initial parameters: try randomly selected initial values within ranges:

$f(x) = p_1(1-x)^{p_2}x^{p_3+p_4 lnx+p_5 ln^2 x}$

p1: Nbkg
p2: [-100, 100]
p3: [-100, 100]
p4: [-50, 50]
p5: [-10, 10]

Fit status == 0 or 1
AND
p-value > 0.001?
$S_{spur} < 0.5\sigma$ AND
$S_{fit} - S_{inj} < 0.5\sigma_{fit}$?

y → Fit success
→ S+B interpretation

n ↓

2. BH Interval Blinding

Window exclusion (identified by BH) → Fit status == 0 or 1 AND p-value > 0.001? —**n**→ Repeat B-only process with BH-blinded spectrum

→ S+B interpretation

y ↓

B-only fit success ←**y**— Full range BH P(BH) > 0.05 ? —**n**→

3. Run F-test and change function to optimal # parameters (4, 5, 6, 7)

DOF+1 (1x only)

Fit status == 0 or 1
AND
p-value > 0.001?
$S_{spur} < 0.5\sigma$ AND
$S_{fit} - S_{inj} < 0.5\sigma_{fit}$?

y → Fit success
→ S+B interpretation

n ↓

DOF+1 (1x only)

3. Reduce fit range [2000, 6000] GeV

Fit status == 0 or 1
AND
p-value > 0.001?
$S_{spur} < 0.5\sigma$ AND
$S_{fit} - S_{inj} < 0.5\sigma_{fit}$?

n → BH to quantify discovery significance
→ S+B interpretation

y → Fit success
→ S+B interpretation