Question 1: Should we have 'xy-iron–xy-…', or 'x-iron-y-iron-x-iron-y- … ?

Signal vs. Background Efficiency, 8 detectors, Varying Geometries

Legend:
- 20 cm iron, (XY) - 60 cm total
- 20 cm iron, X-Y - 140 cm total
- 10 cm iron, X-Y - 70 cm total
- 5 cm iron, X-Y - 35 cm total
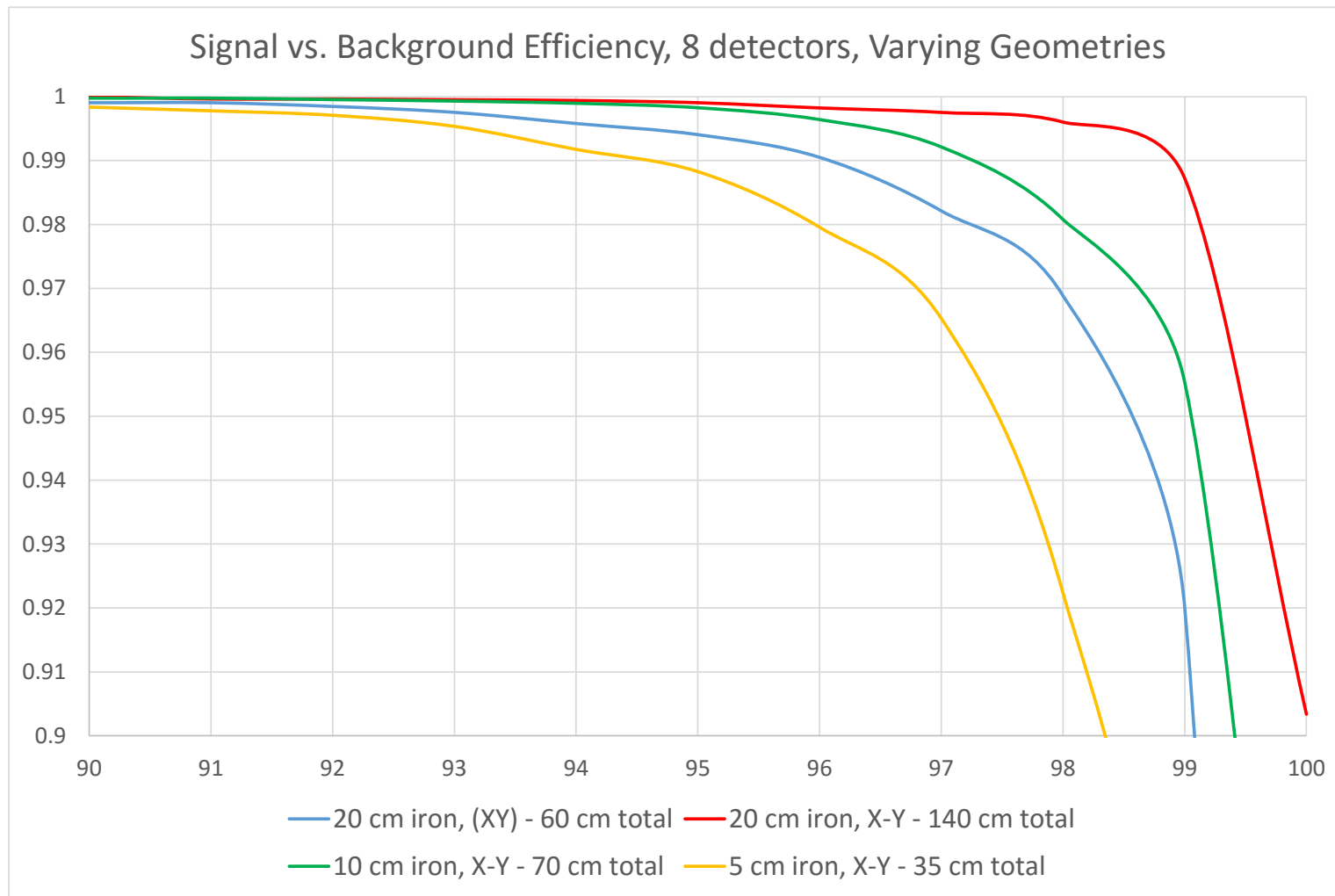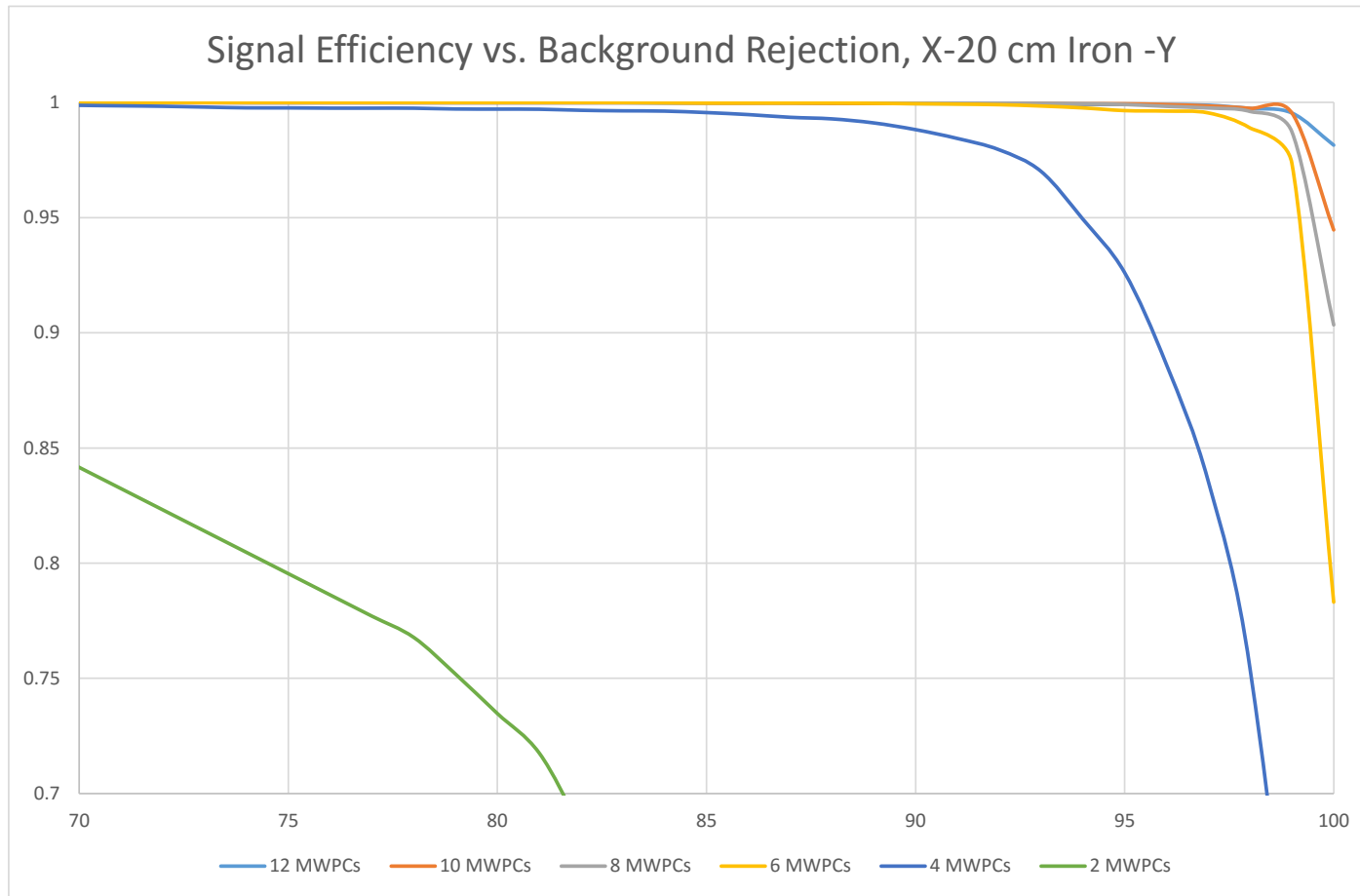
Compare blue (xy-iron-xy…) and green (x-iron-y-iron…) :   Green is better.
To do: adjust so total amount of iron is identical.

Question 2: For a fixed number of detectors (try 8) arranged in 'x-iron-y-iron-...' , what's the optimal amount of iron between the detectors.

Signal vs. Background Efficiency, 8 detectors, Varying Geometries

— 20 cm iron, (XY) - 60 cm total — 20 cm iron, X-Y - 140 cm total
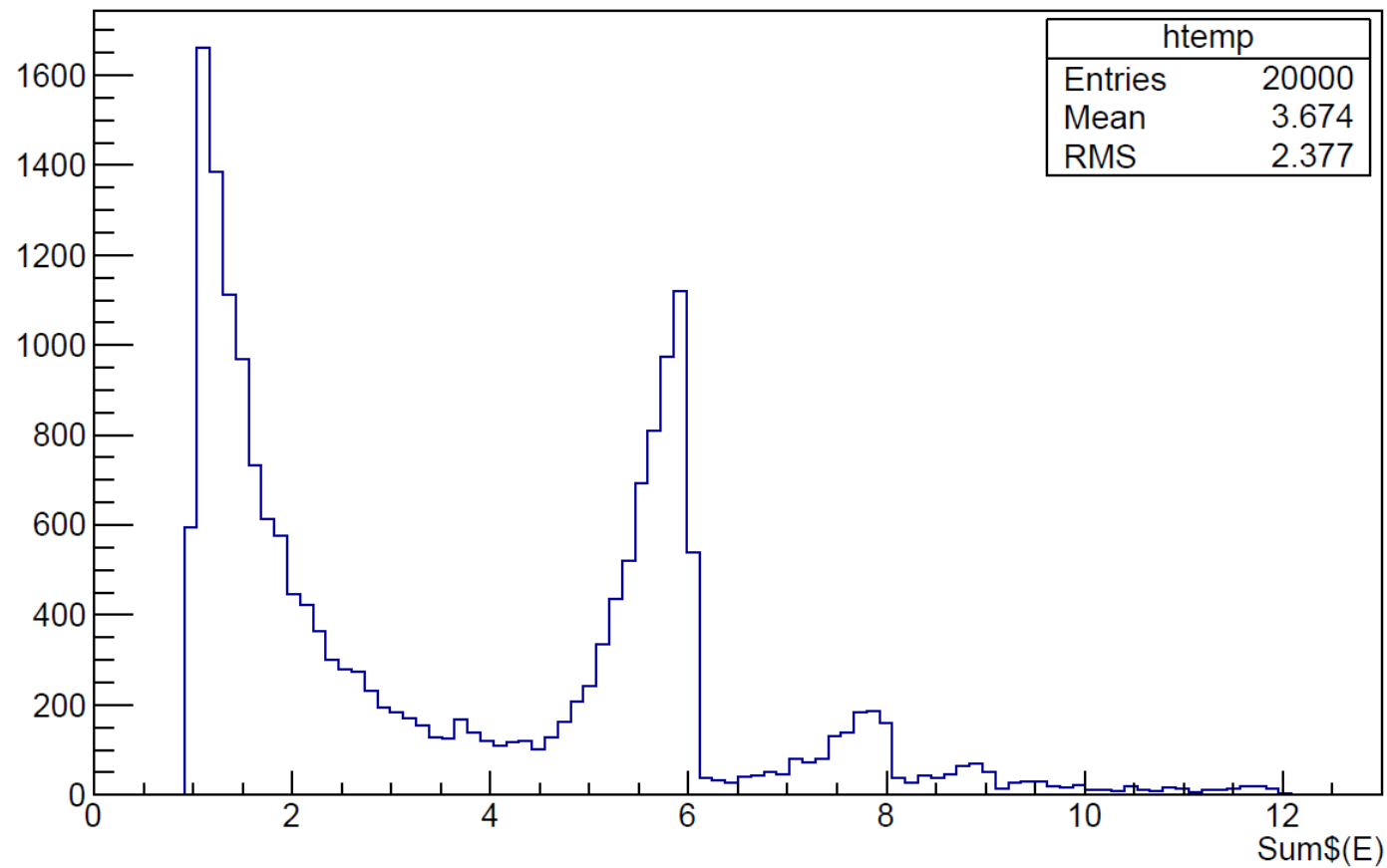— 10 cm iron, X-Y - 70 cm total — 5 cm iron, X-Y - 35 cm total
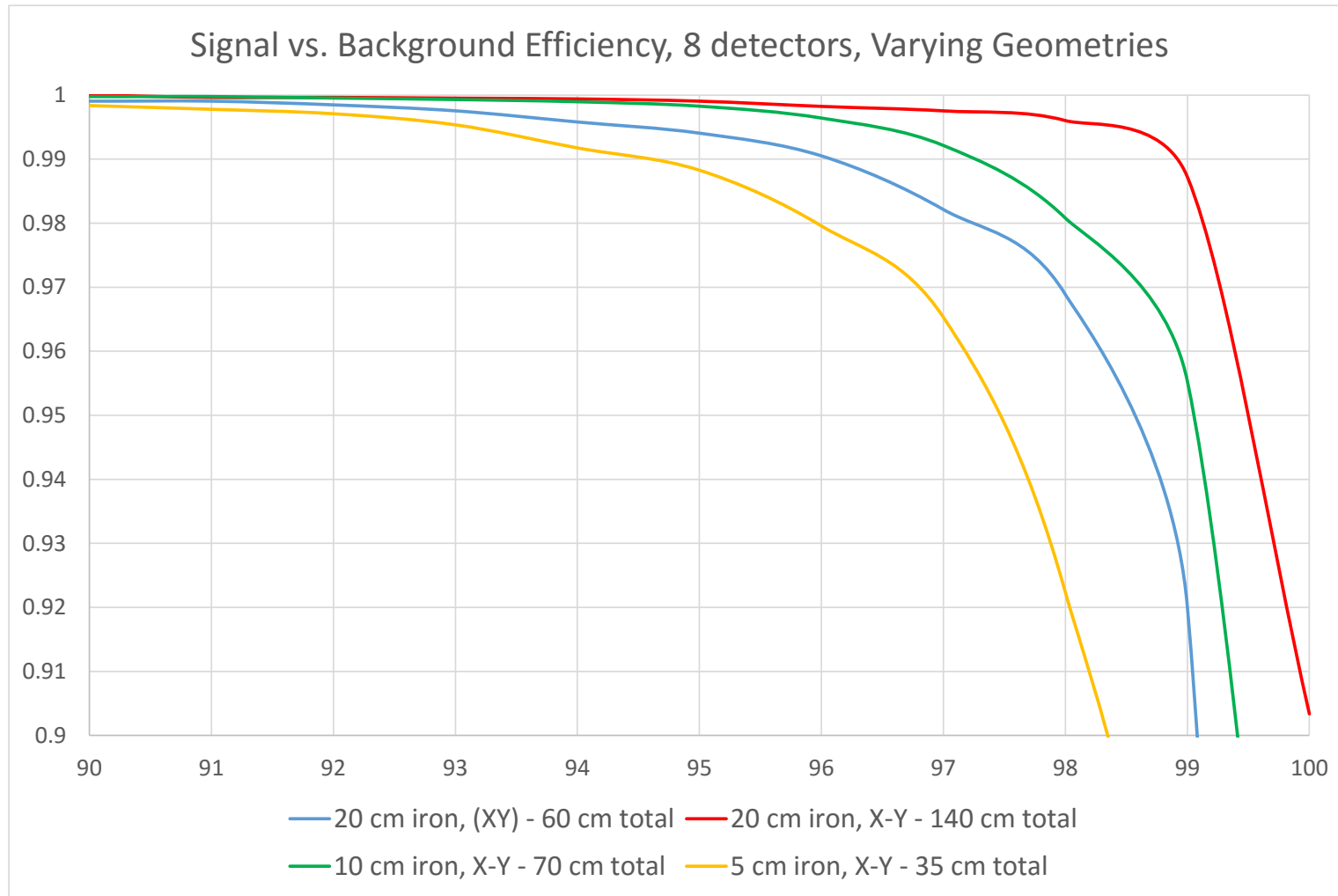
Compare yellow (5 cm), green (10 cm) and red (20 cm). Red is best.
To do: try 30 cm.   When does more iron start to hurt, rather than help us?

Question 3: Using 20 cm iron between detectors, study the sensitivity to the total number of detectors (2, 4, 6, 8, 10, 12).

Signal Efficiency vs. Background Rejection, X-20 cm Iron -Y

Legend: 12 MWPCs, 10 MWPCs, 8 MWPCs, 6 MWPCs, 4 MWPCs, 2 MWPCs

Improvement beyond 8 detectors (grey) is marginal.

Input Energy Distribution

8 Detectors, Varying Energy Minimum Limits

Background Rejection Ratio — Signal Efficiency

5.0 GeV min   4.5 GeV min   4.0 GeV min   3.5 GeV min   3.0 GeV

2.5 GeV   2.0 GeV   1.5 GeV   1.0 GeV