BOOST Top Tagging Update

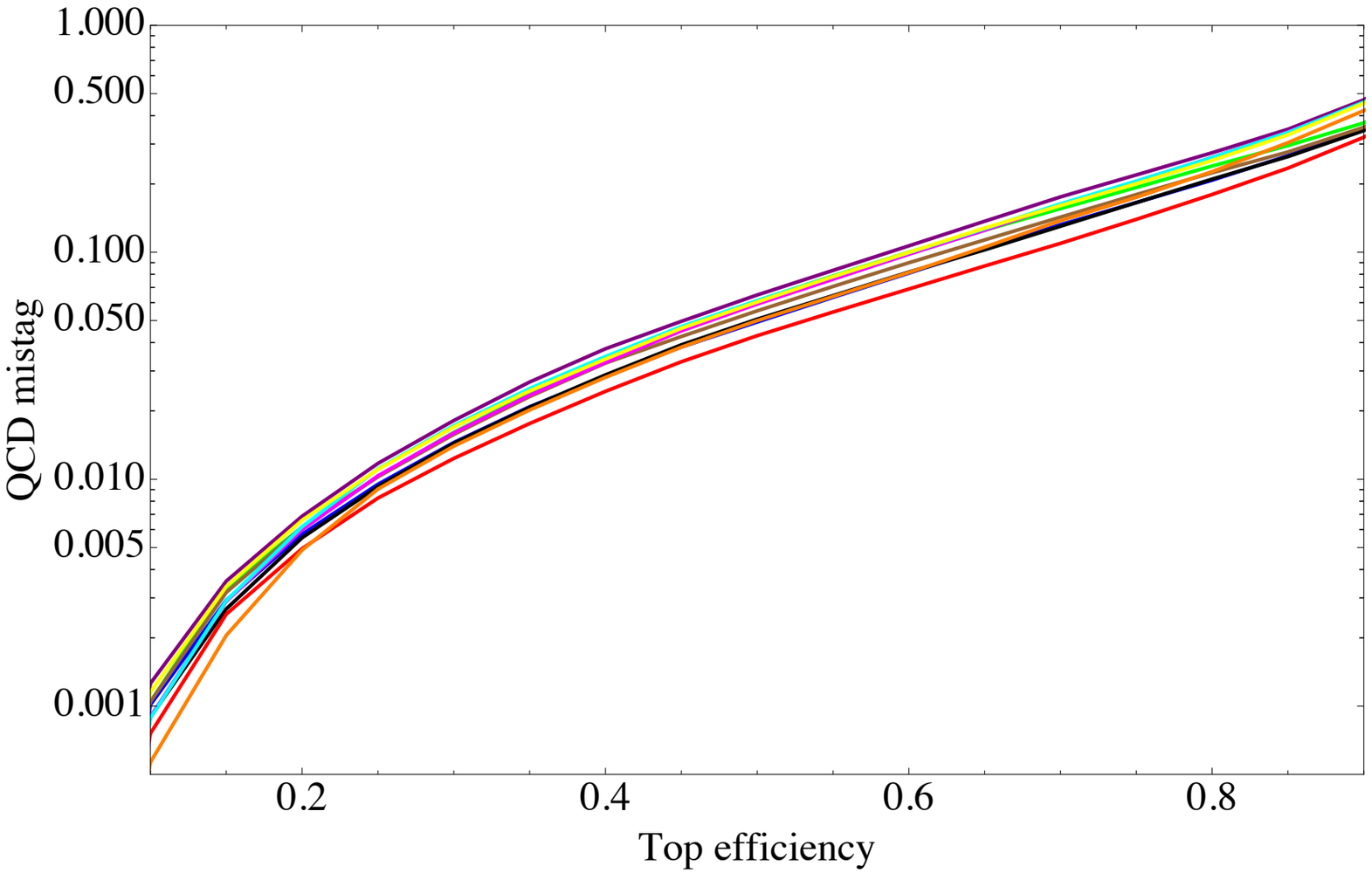
6 June 2014

Brian Shuve

Update

- Comparison of top tagger + jet shape combinations
- Comparison of fully optimized vs. optimizing for eff = 0.3
- 600-700, 1000-1100, 1500-1600 GeV pT bins
- R = 0.7 and R = 1.0

pT = 600-700 GeV
R = 0.7



JH

JH + tau32b1 + tau21b1

JH + Qjet vol.

JH + C2b1 + C3b1

JH + C + tau + Qjet

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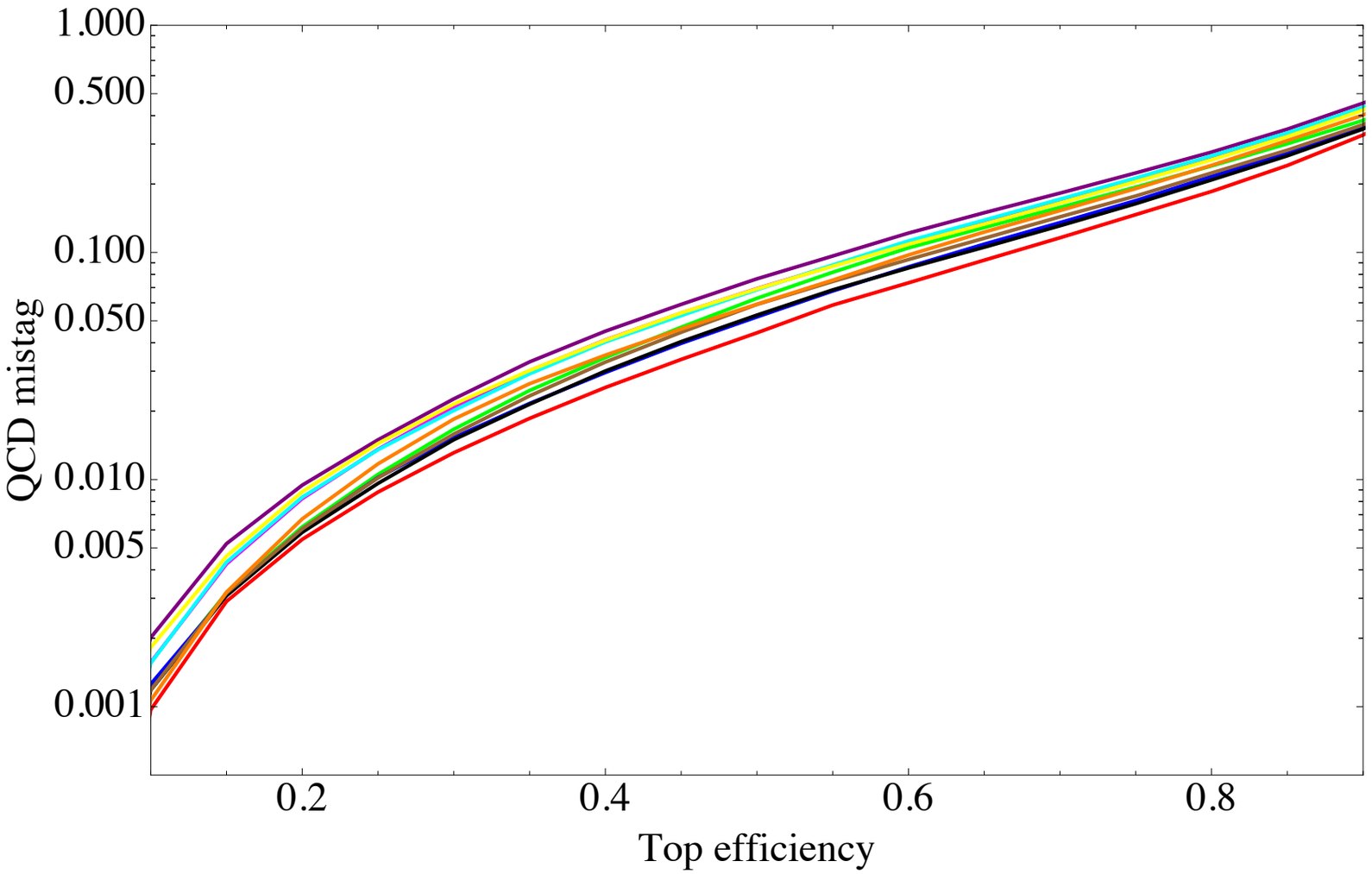

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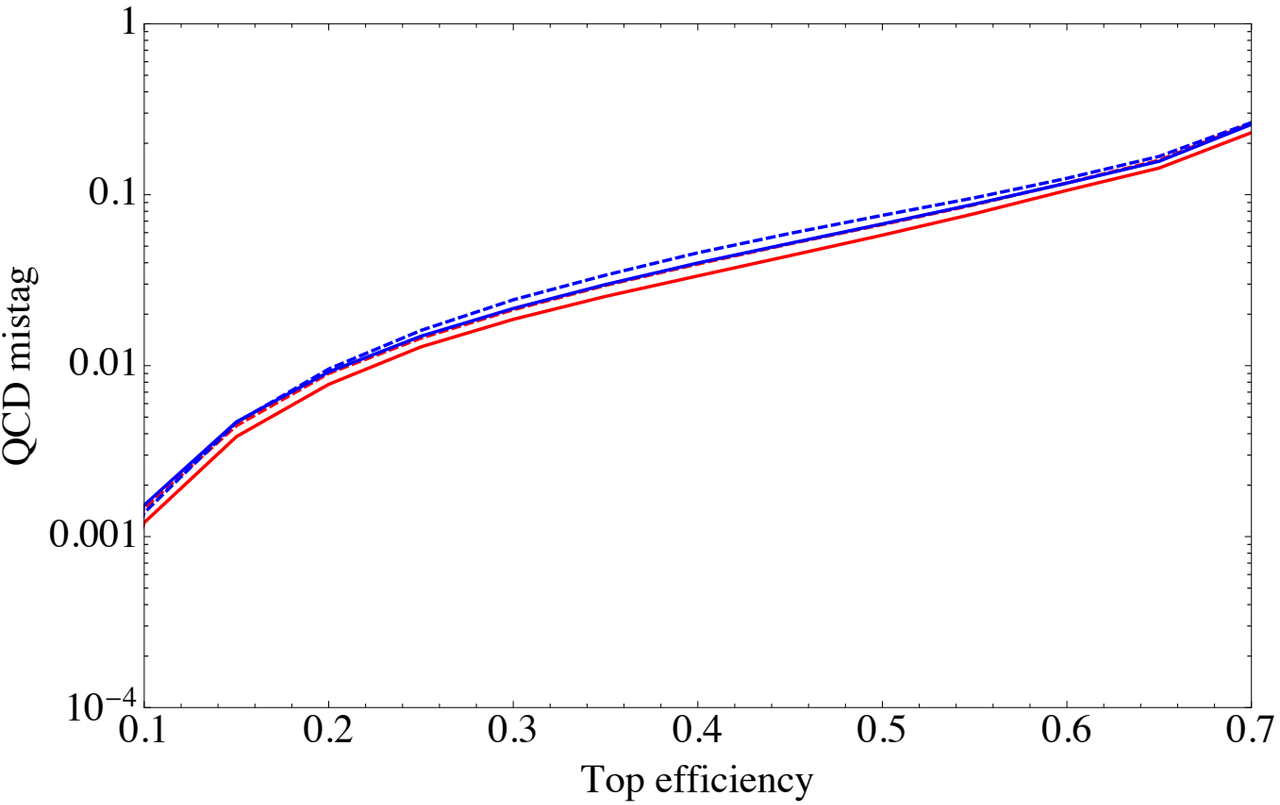
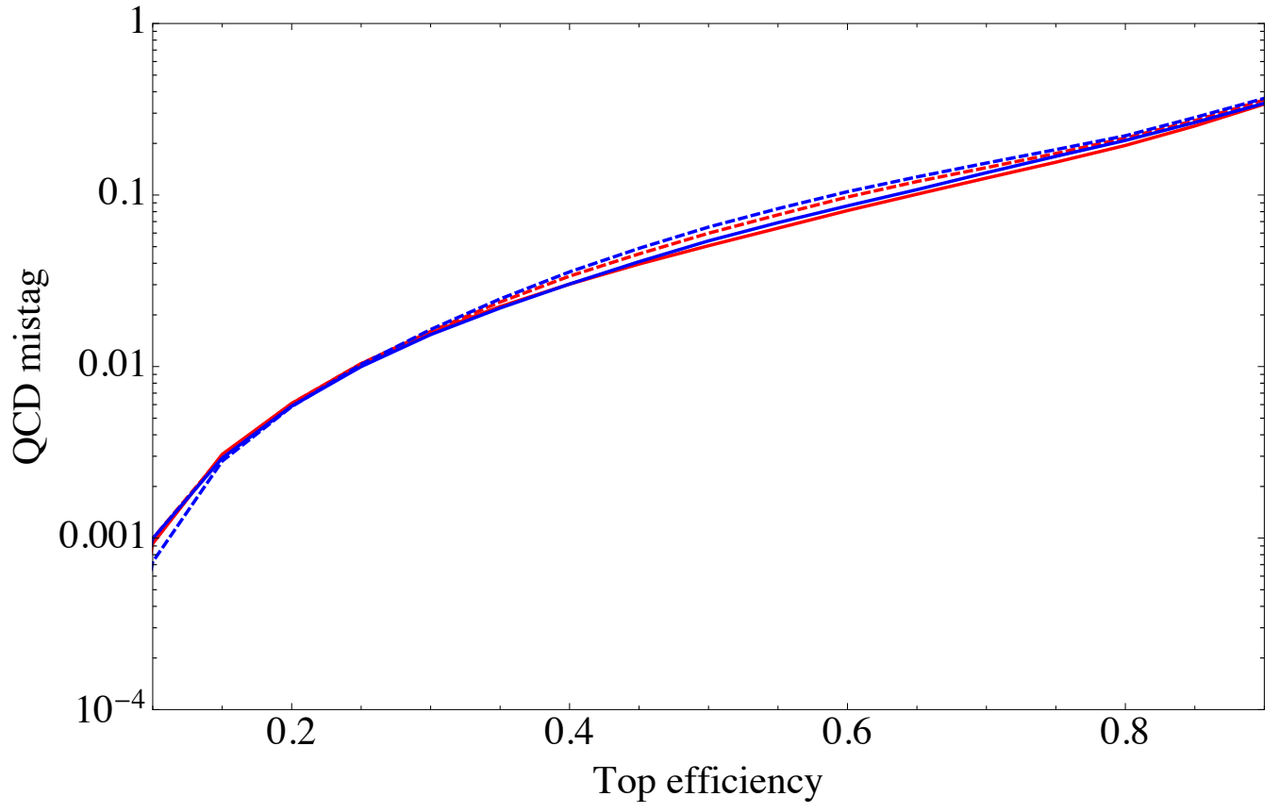
pT = 600-700 GeV
R = 0.7

What does combining C2 + C3 (or tau32 + tau21) buy you?

Trim



Prune



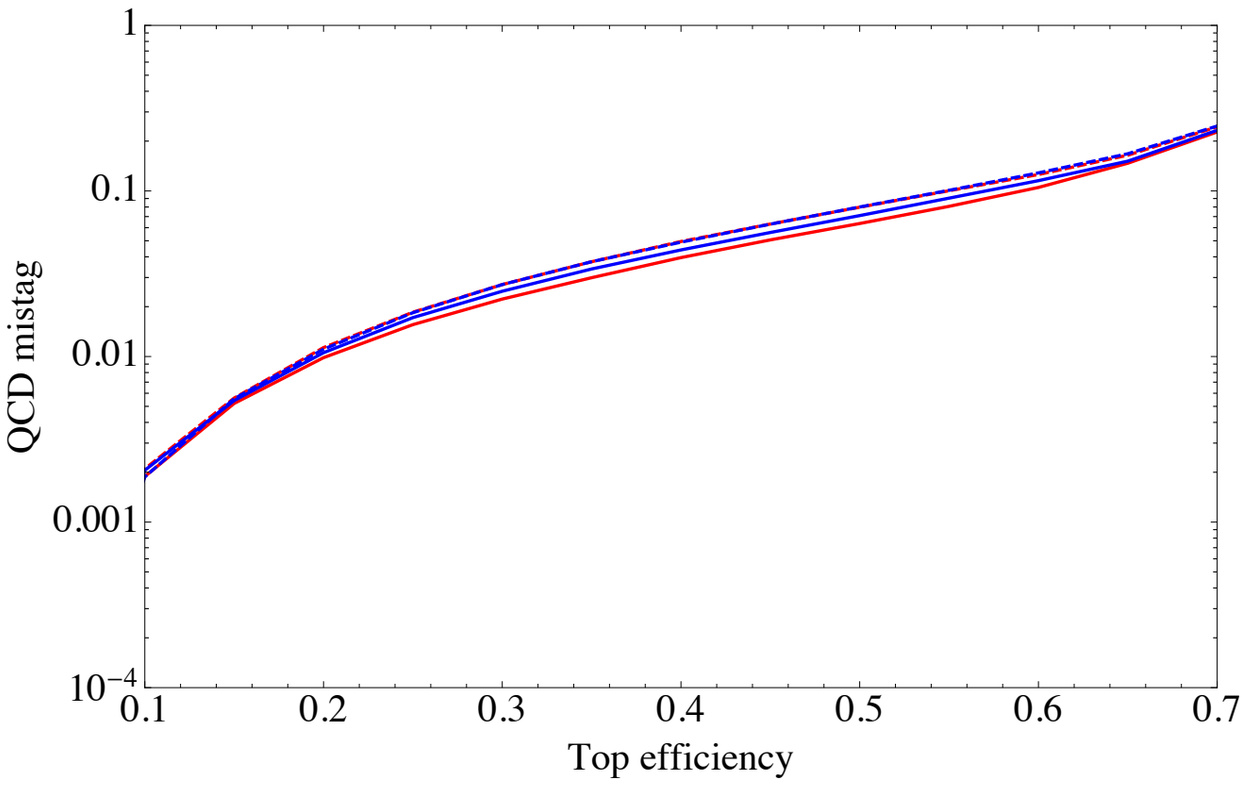
tau32 (dashed), tau32 + tau21 (solid)

C3 (dashed), C2 + C3 (solid)

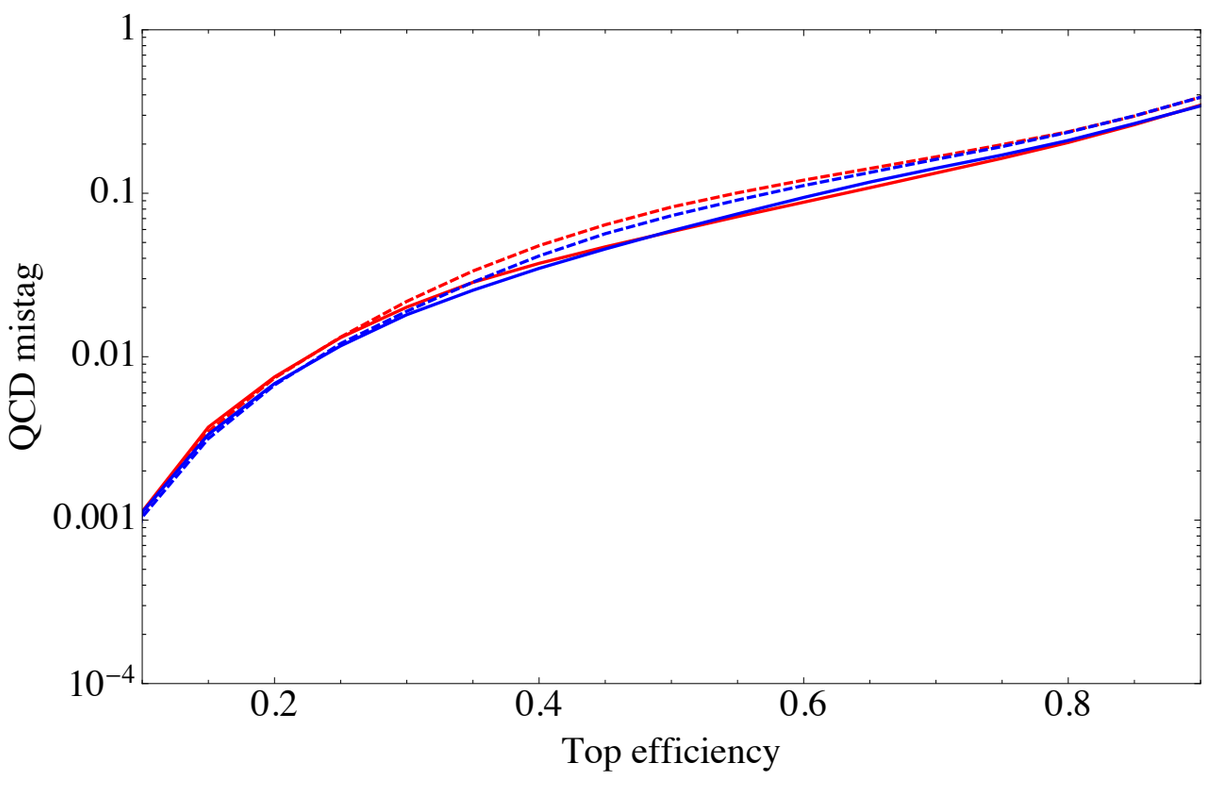
pT = 600-700 GeV
R = 1.0

What does combining C2 + C3 (or tau32 + tau21) buy you?

Trim



Prune



tau32 (dashed), tau32 + tau21 (solid)

C3 (dashed), C2 + C3 (solid)

pT = 600-700 GeV
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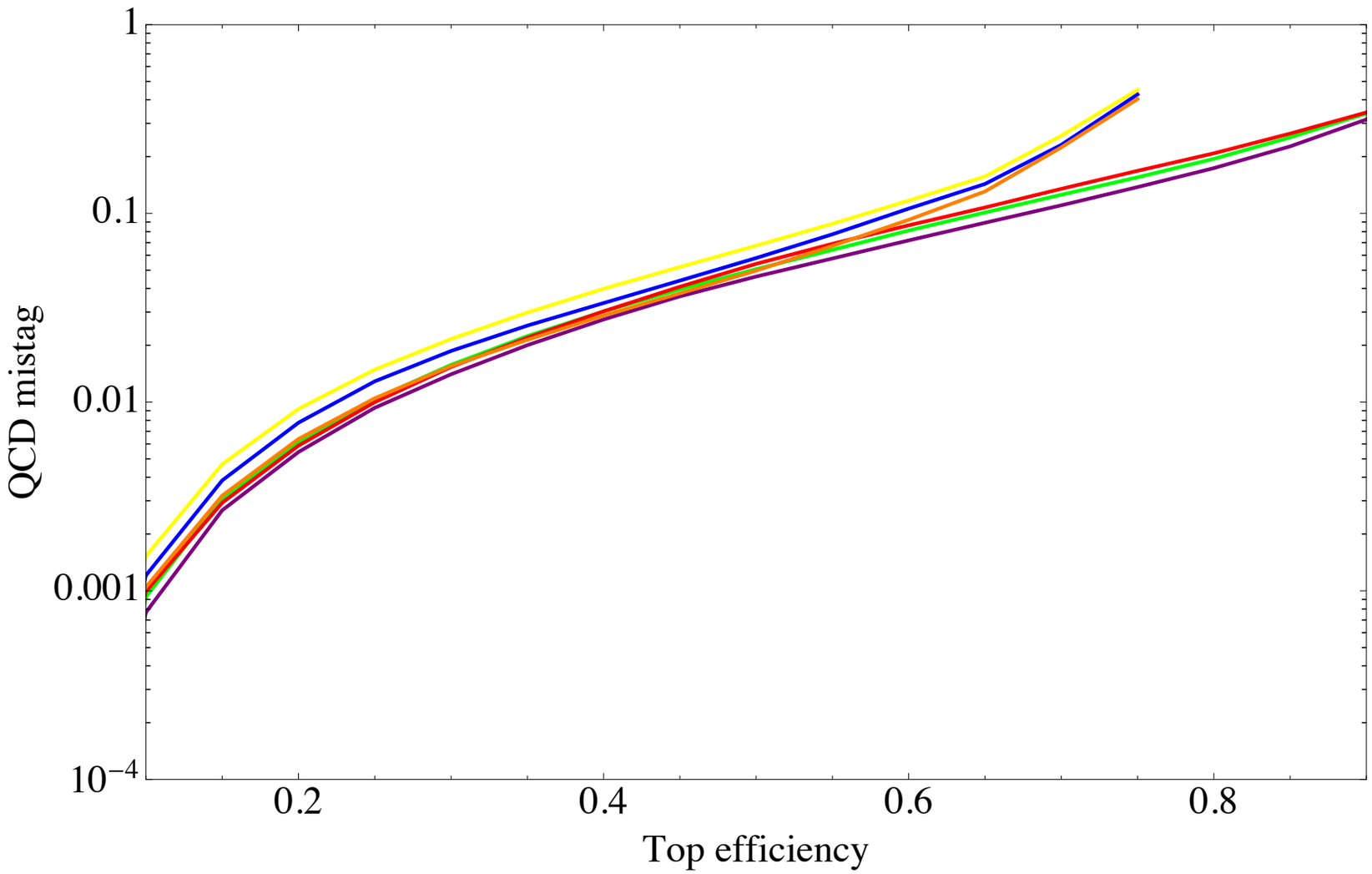

prune: mt + mw + C
prune: mt + mw + tau
prune: mt + mw + all
trim: mt + mw + C
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pT = 600-700 GeV
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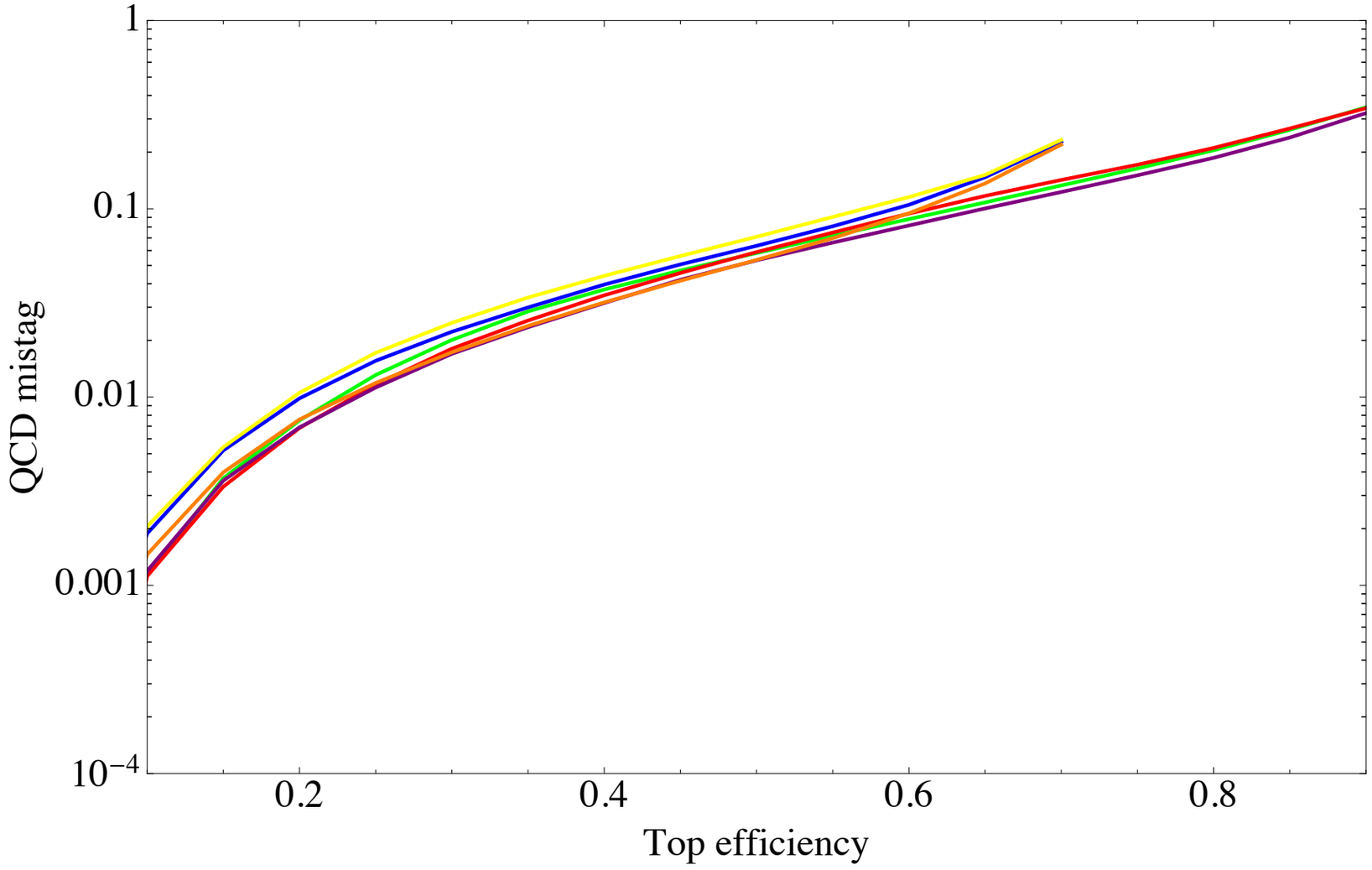

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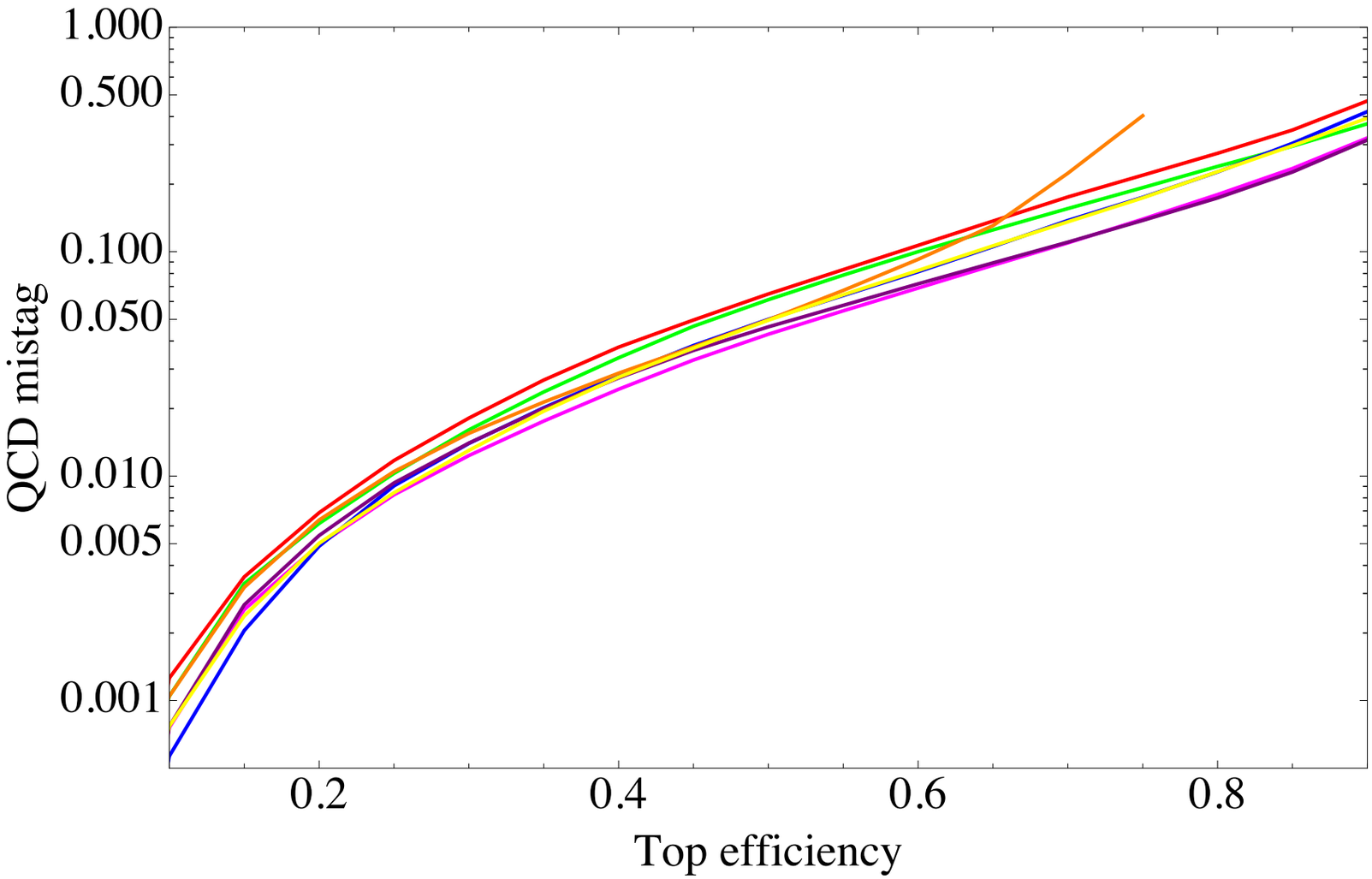


JH

JH + shapes

HEP

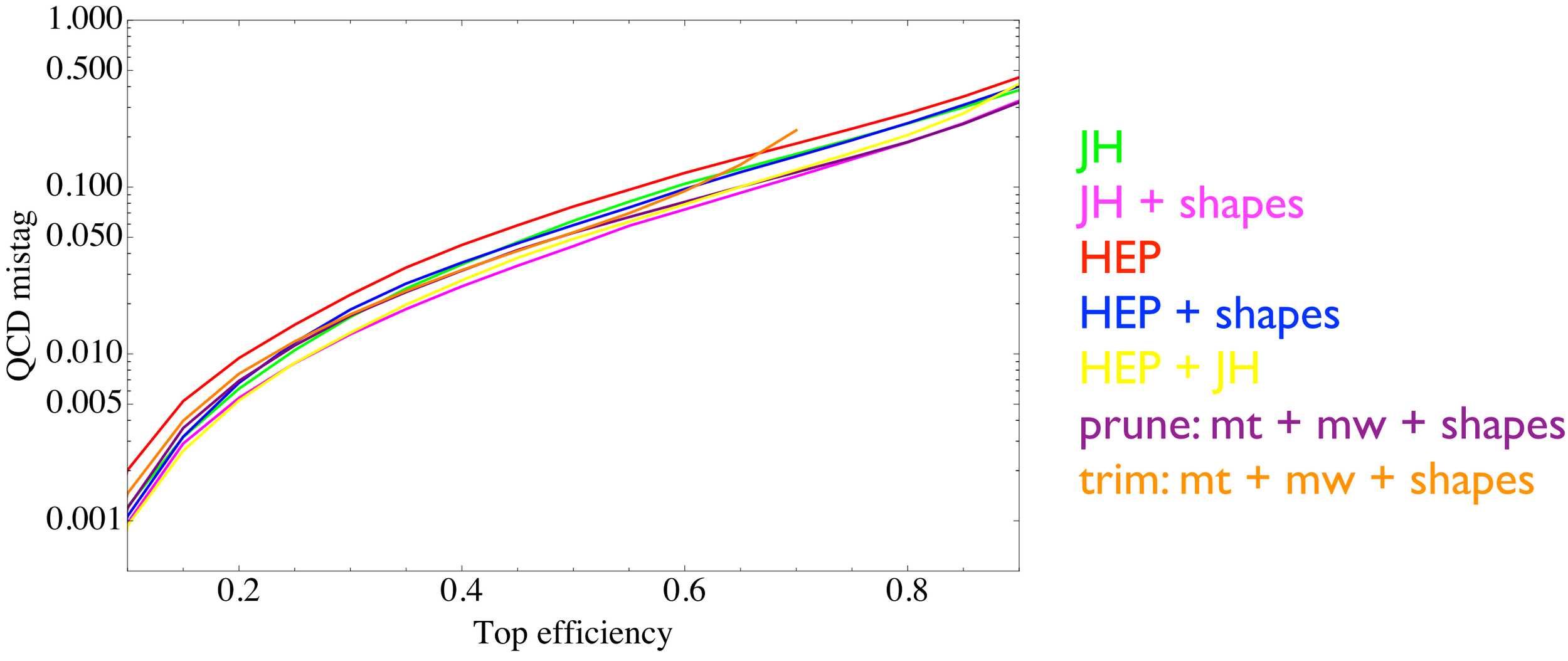
HEP + shapes

HEP + JH

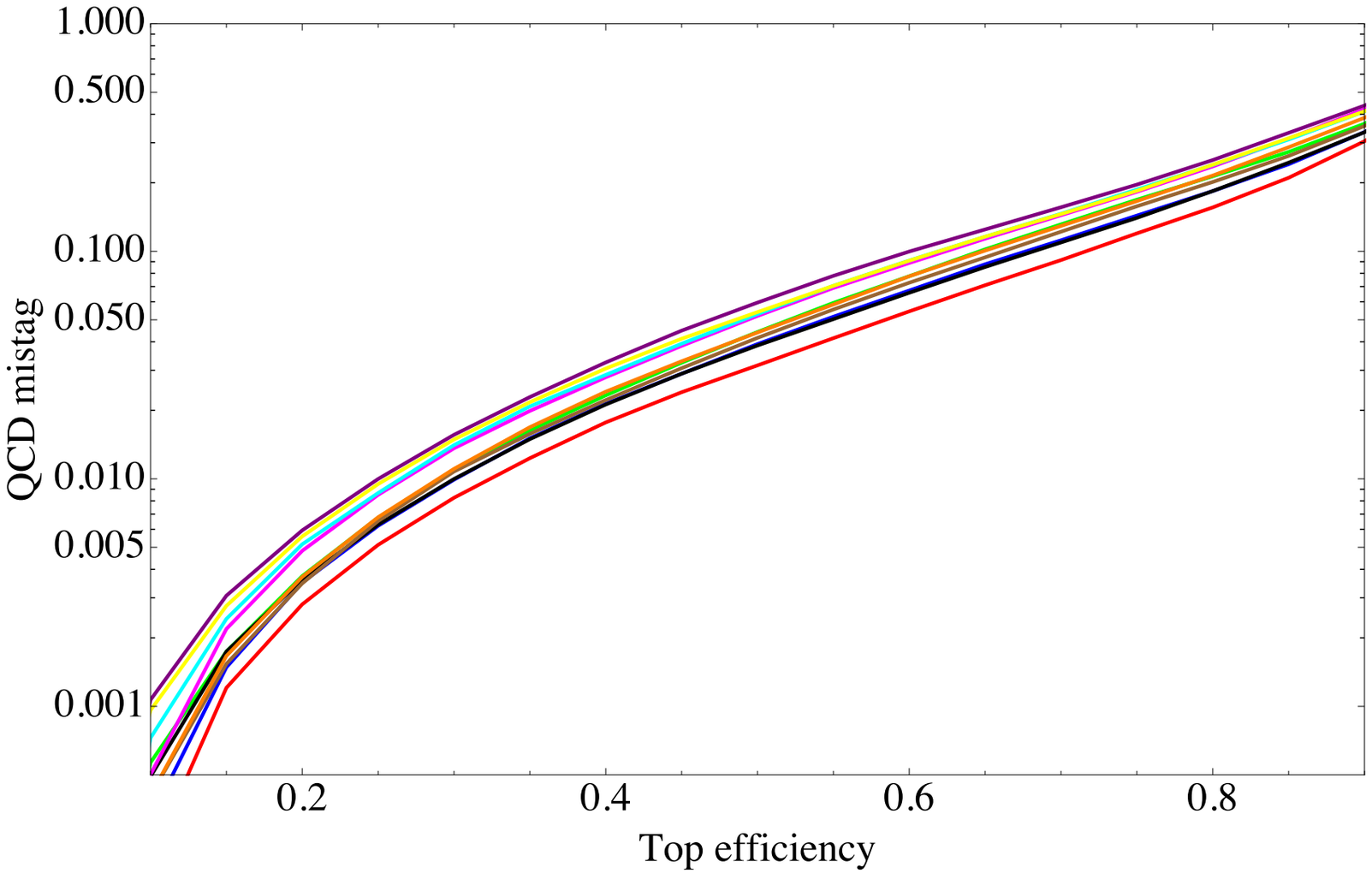
prune: mt + mw + shapes

trim: mt + mw + shapes

pT = 600-700 GeV
R = 1.0



pT = 1000-1100 GeV
R = 0.7



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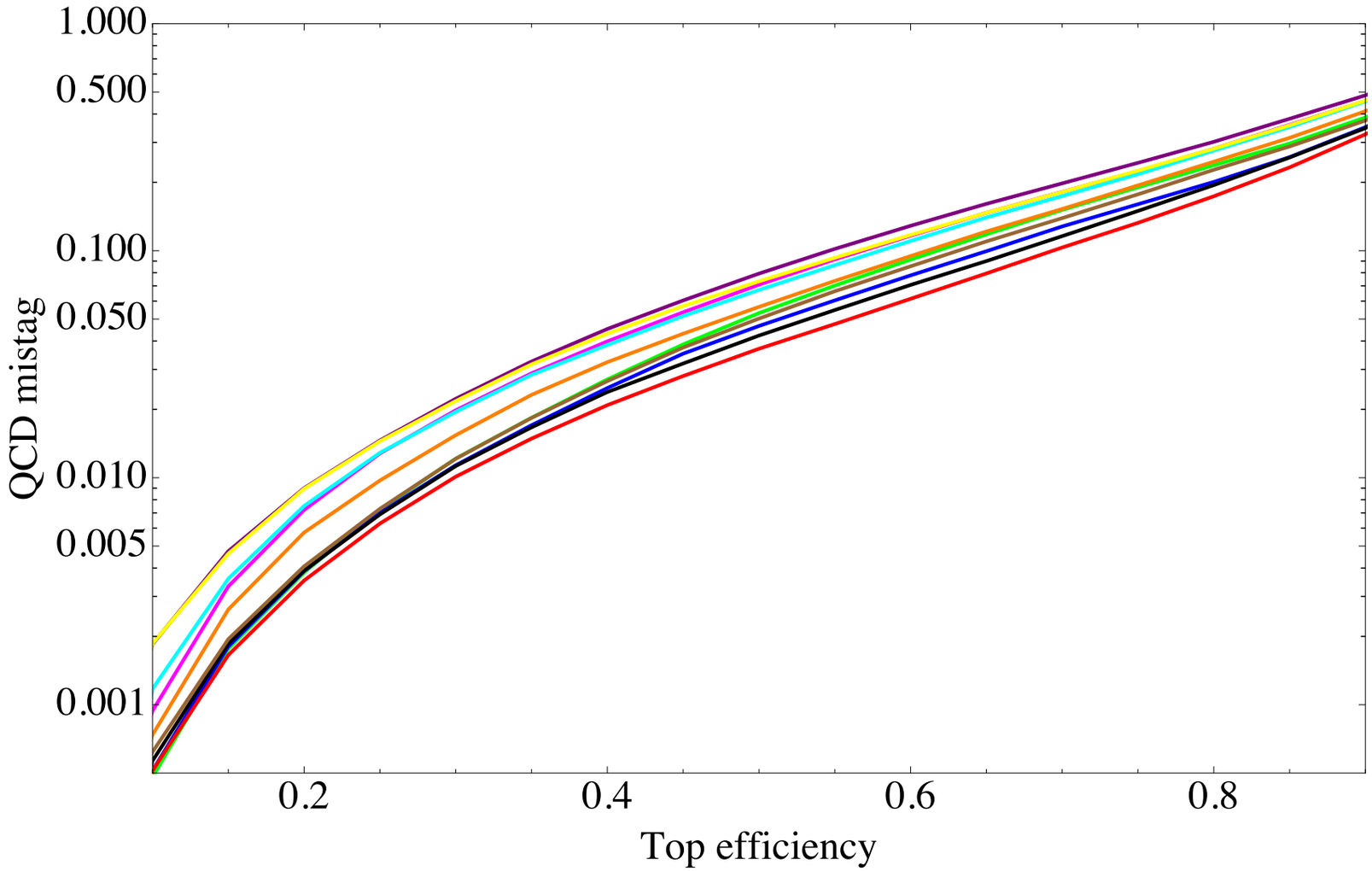

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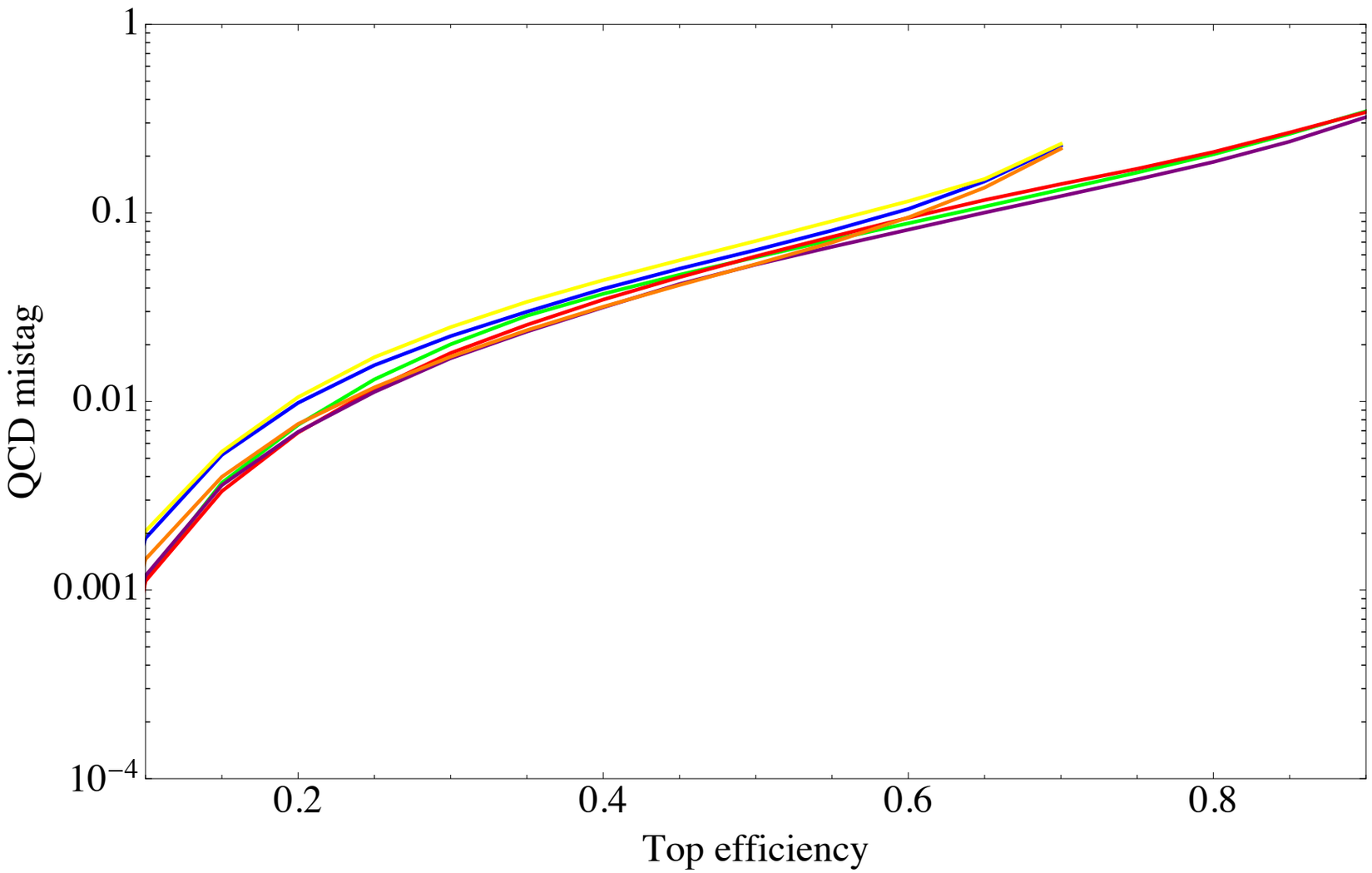

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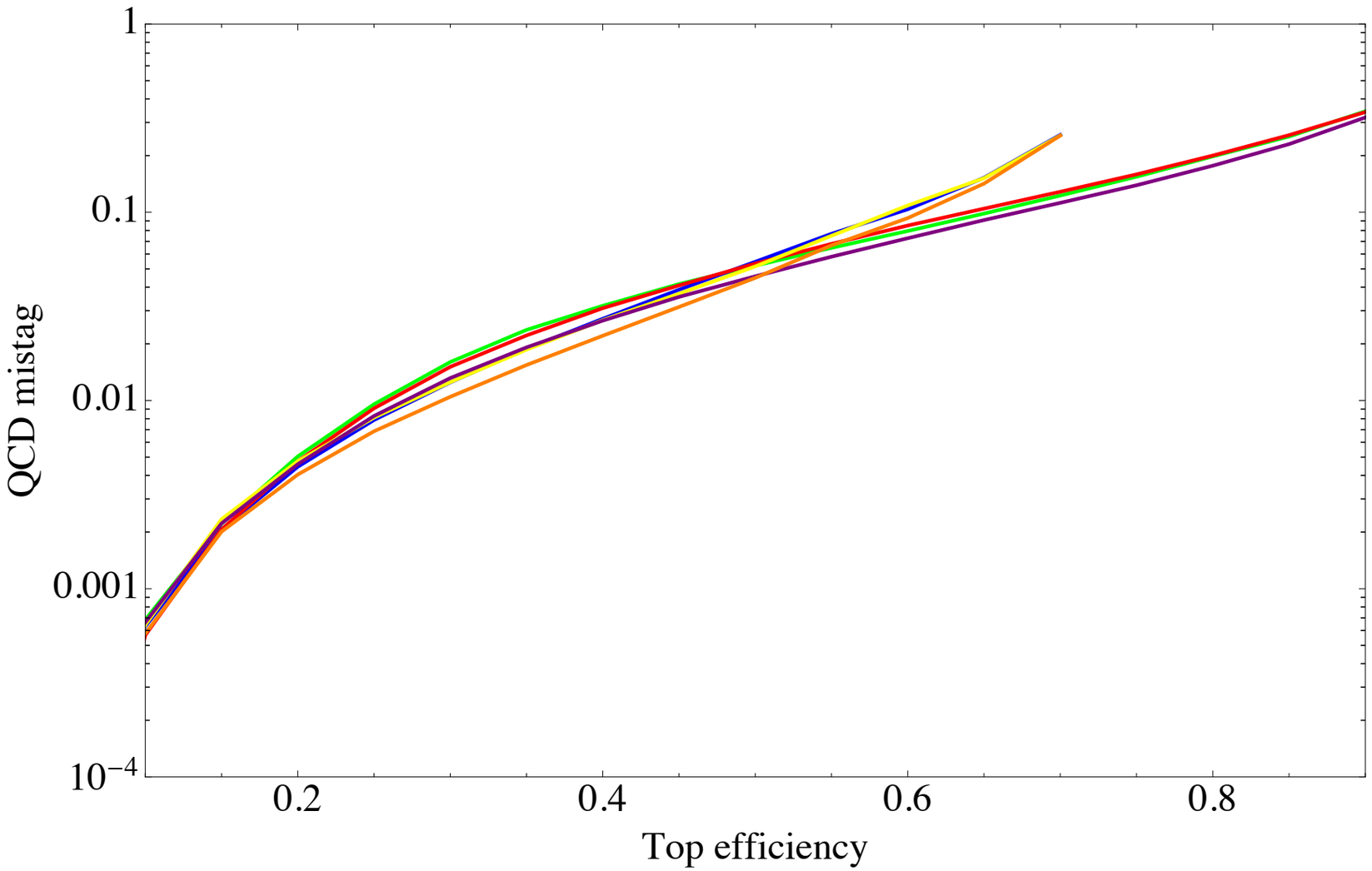

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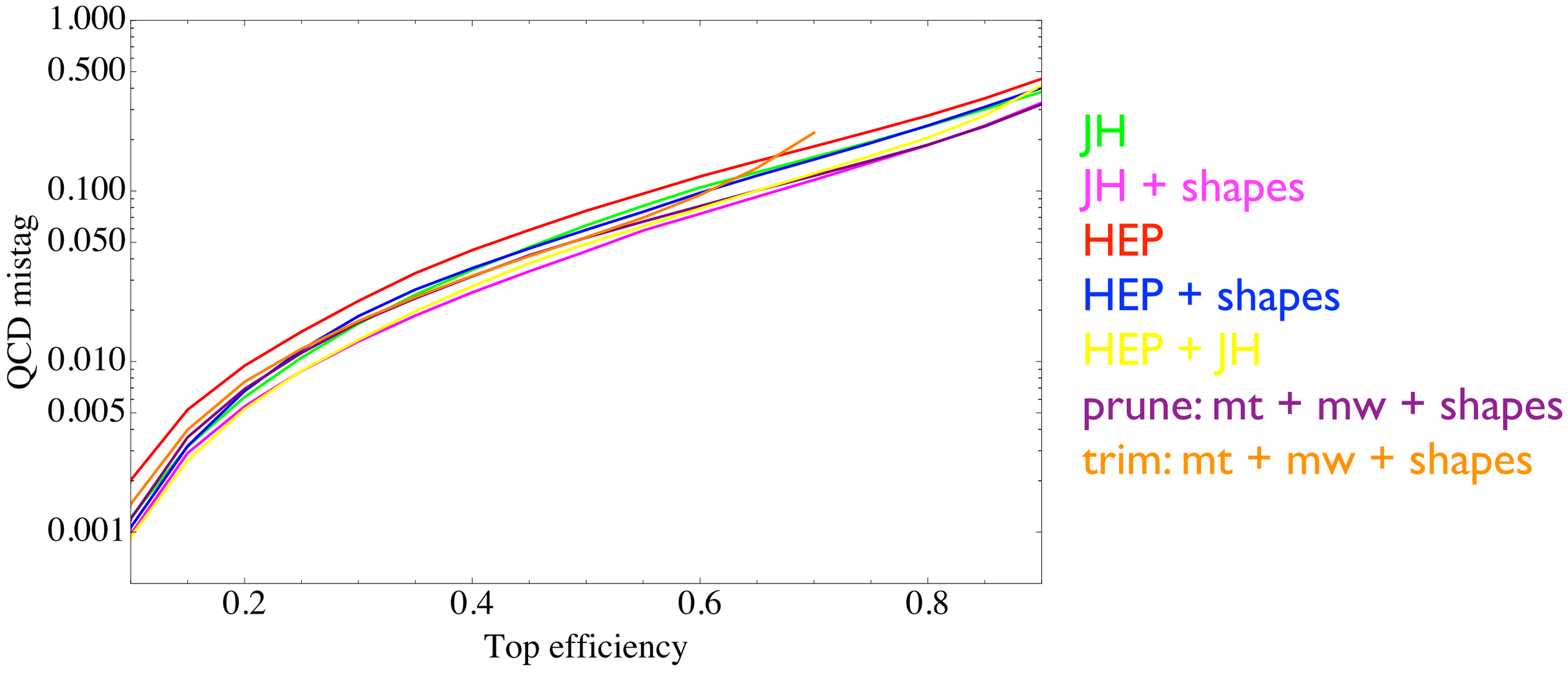

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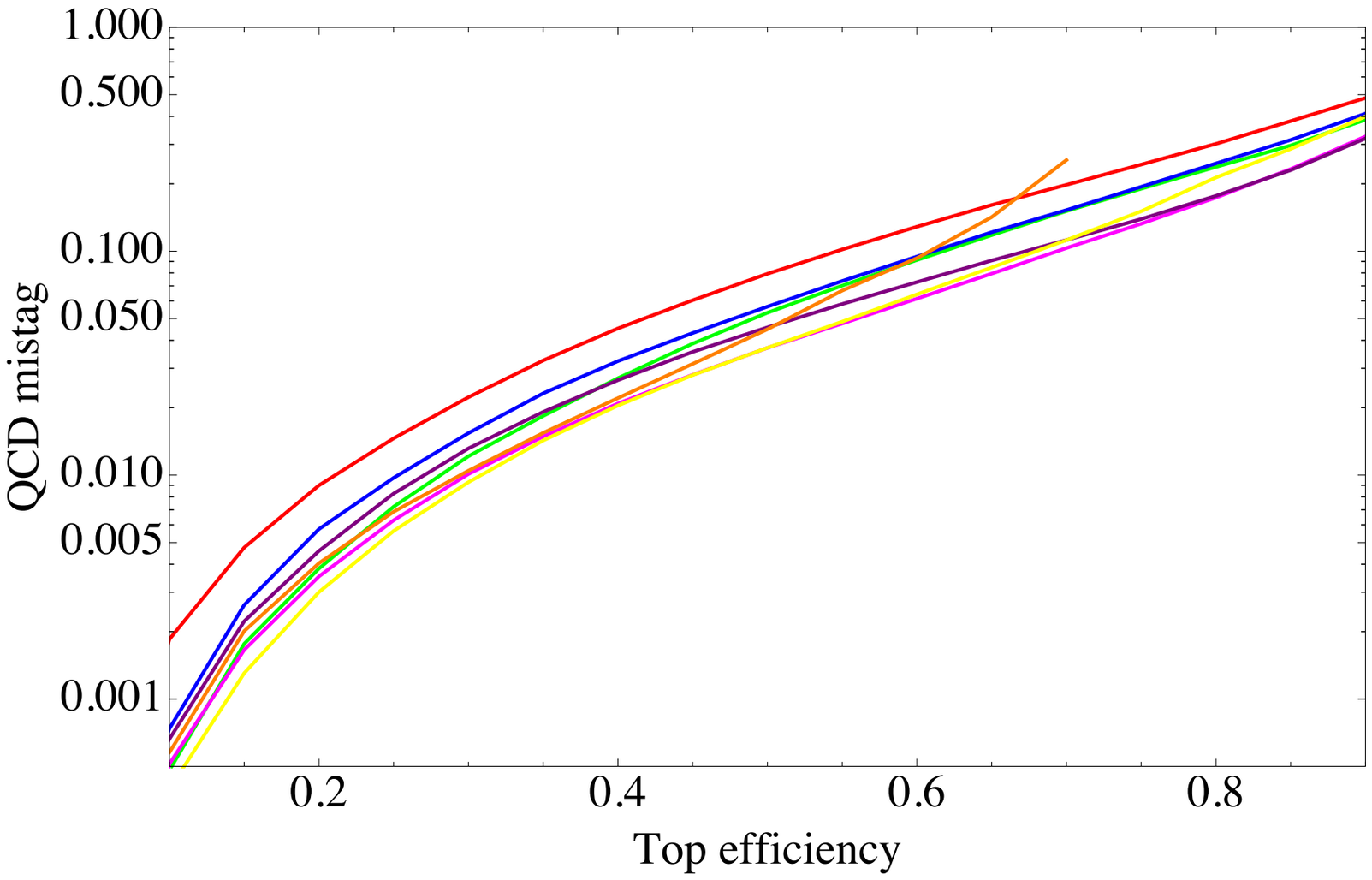

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prune: mt + mw + shapes

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pT = 1500-1600 GeV
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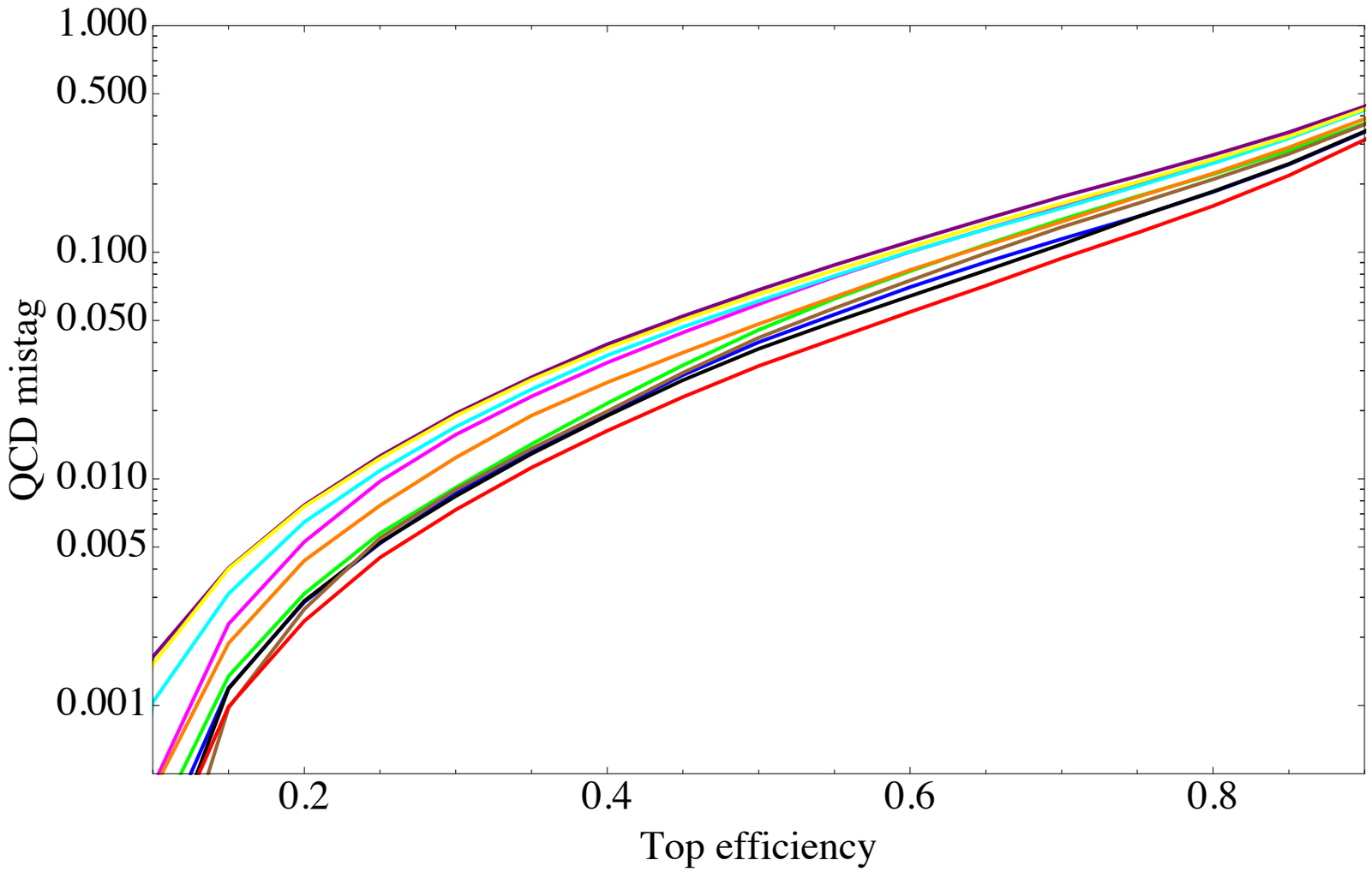

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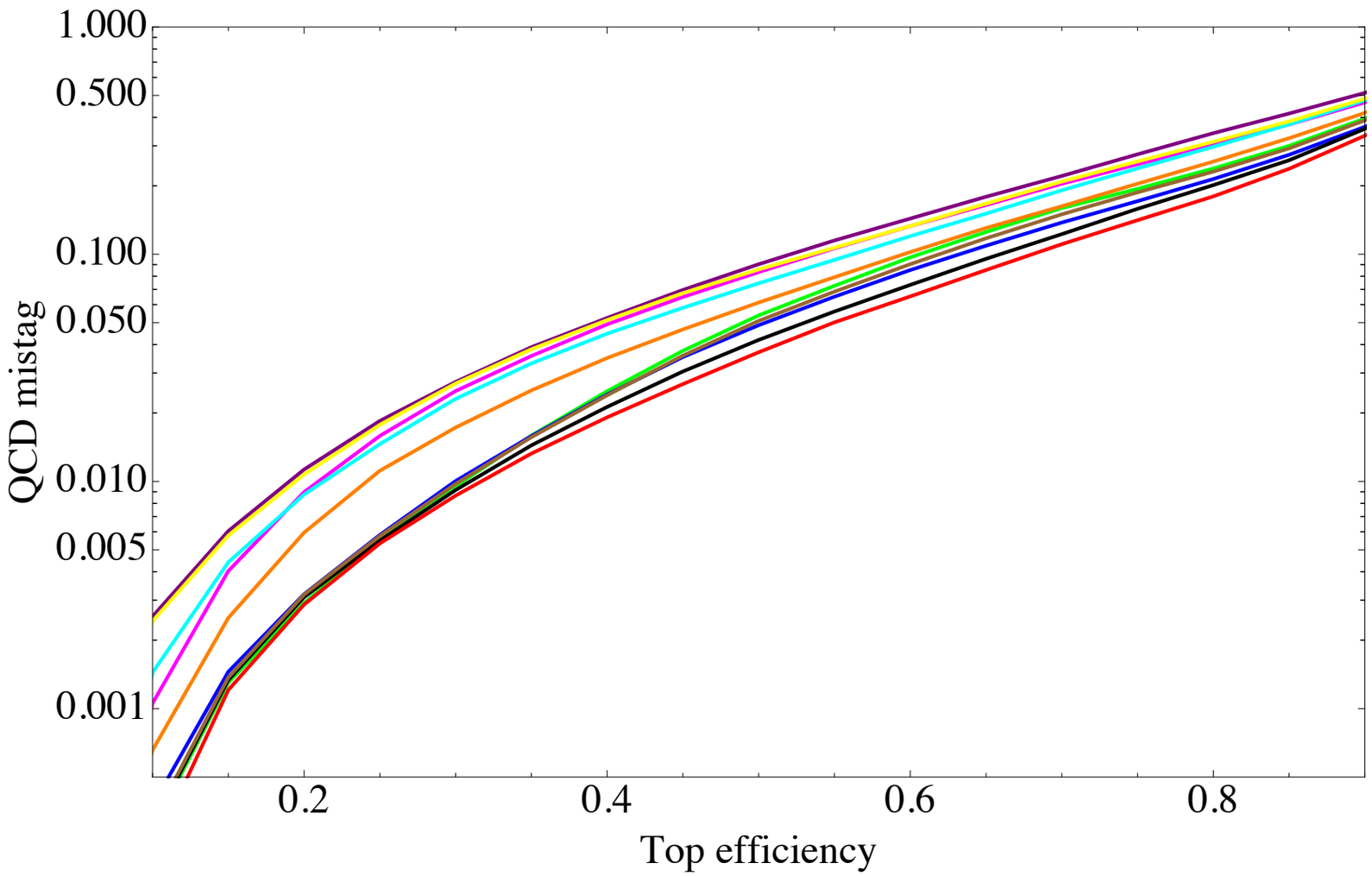

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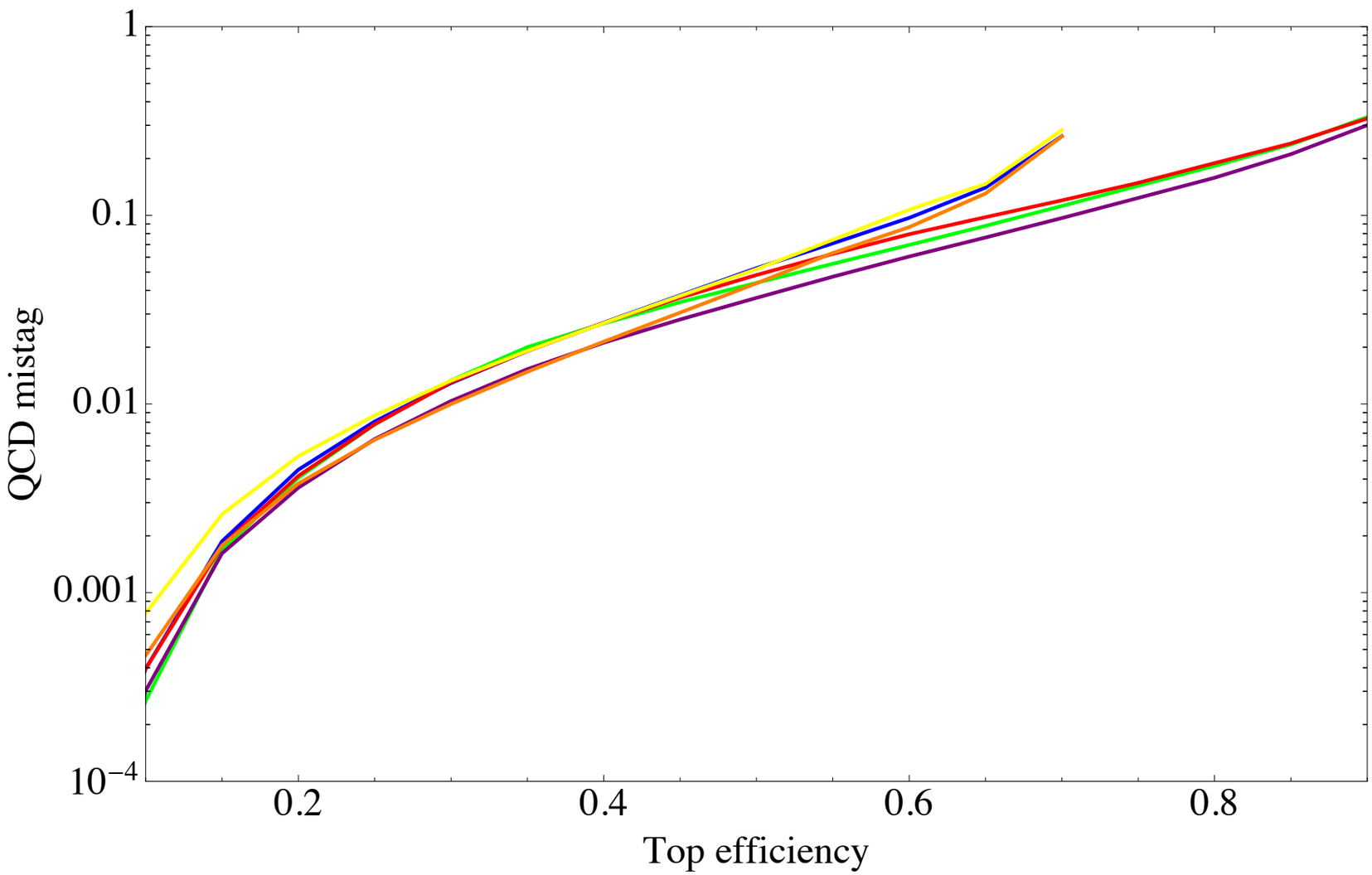

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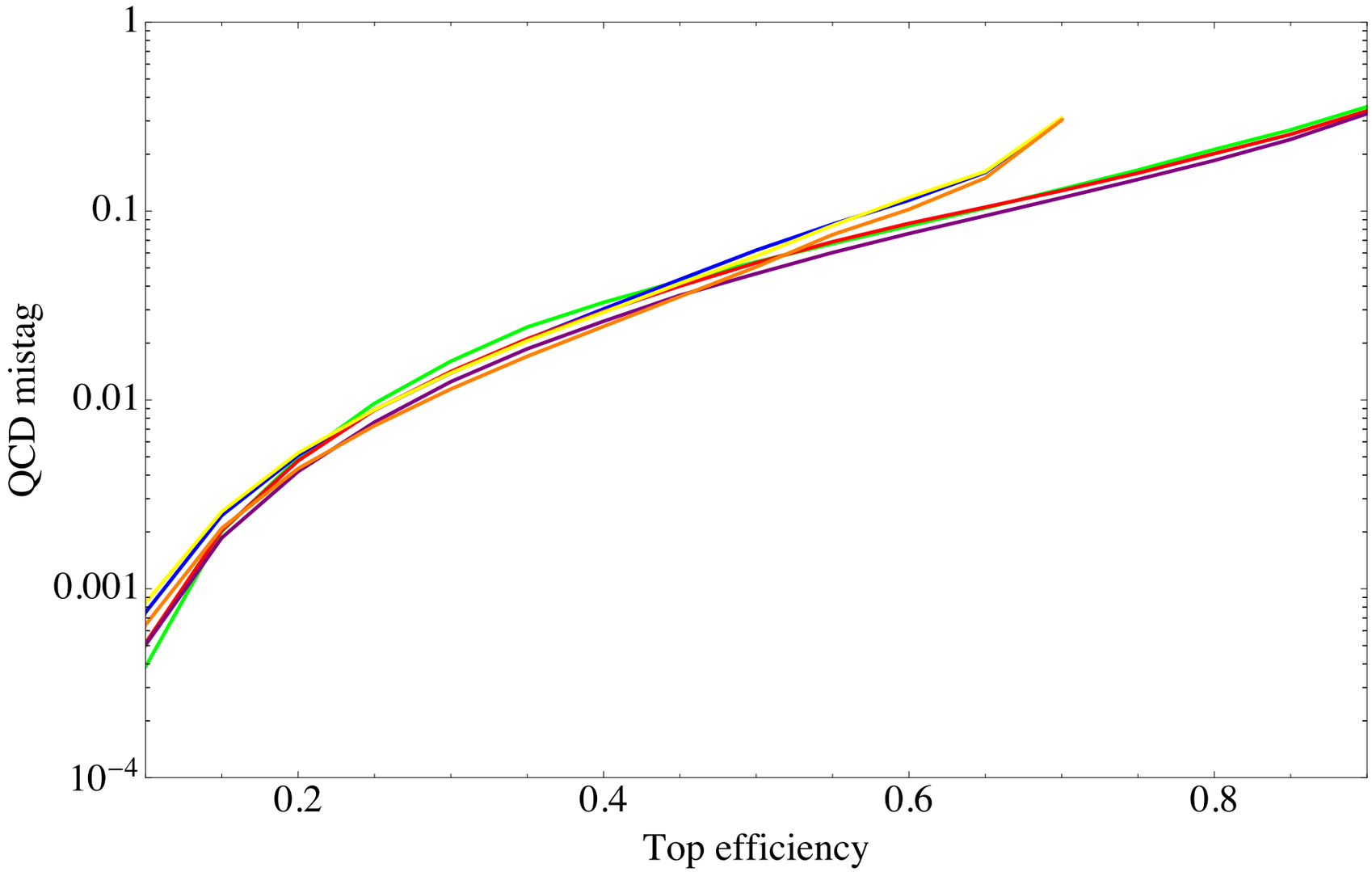

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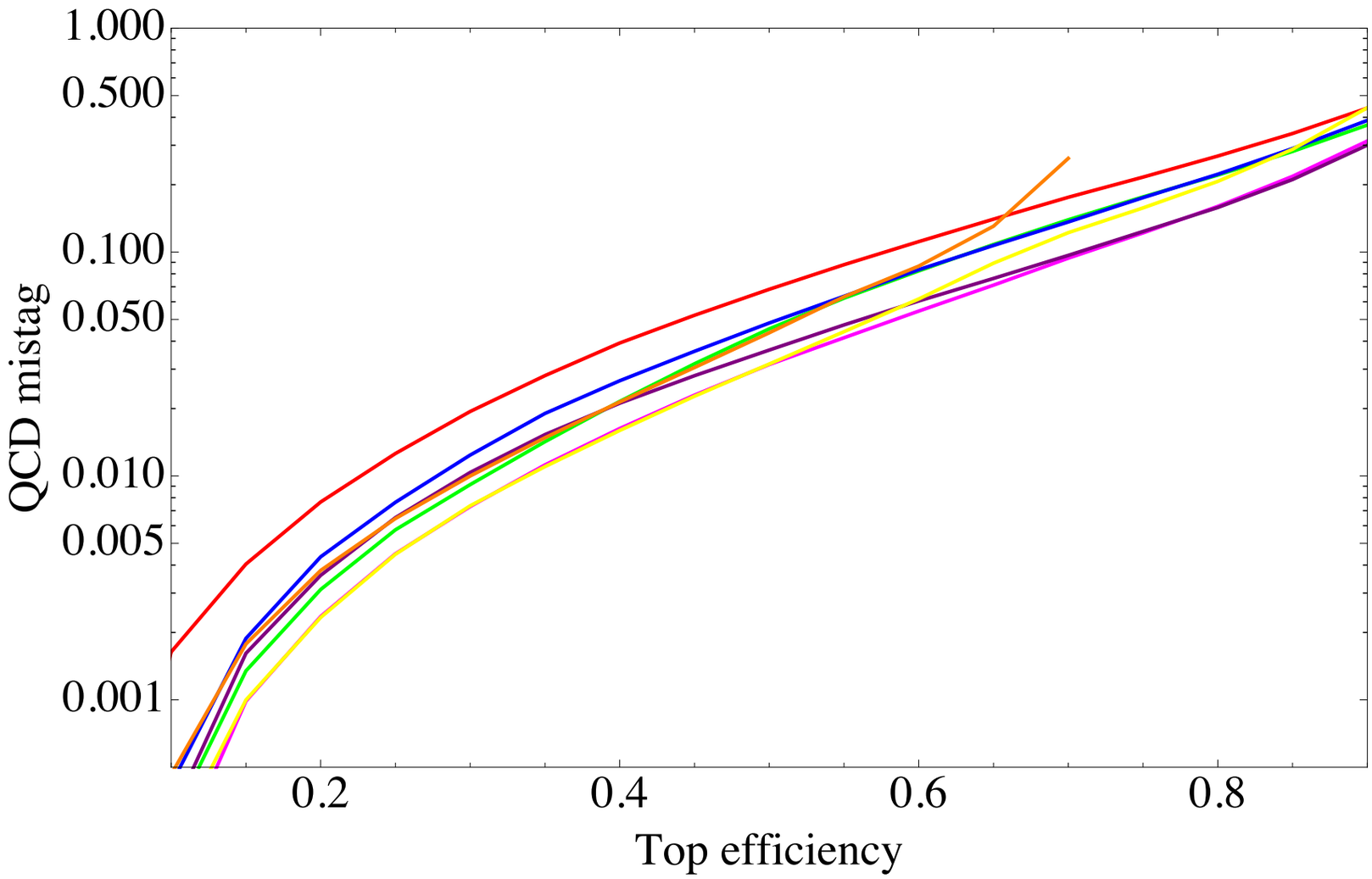

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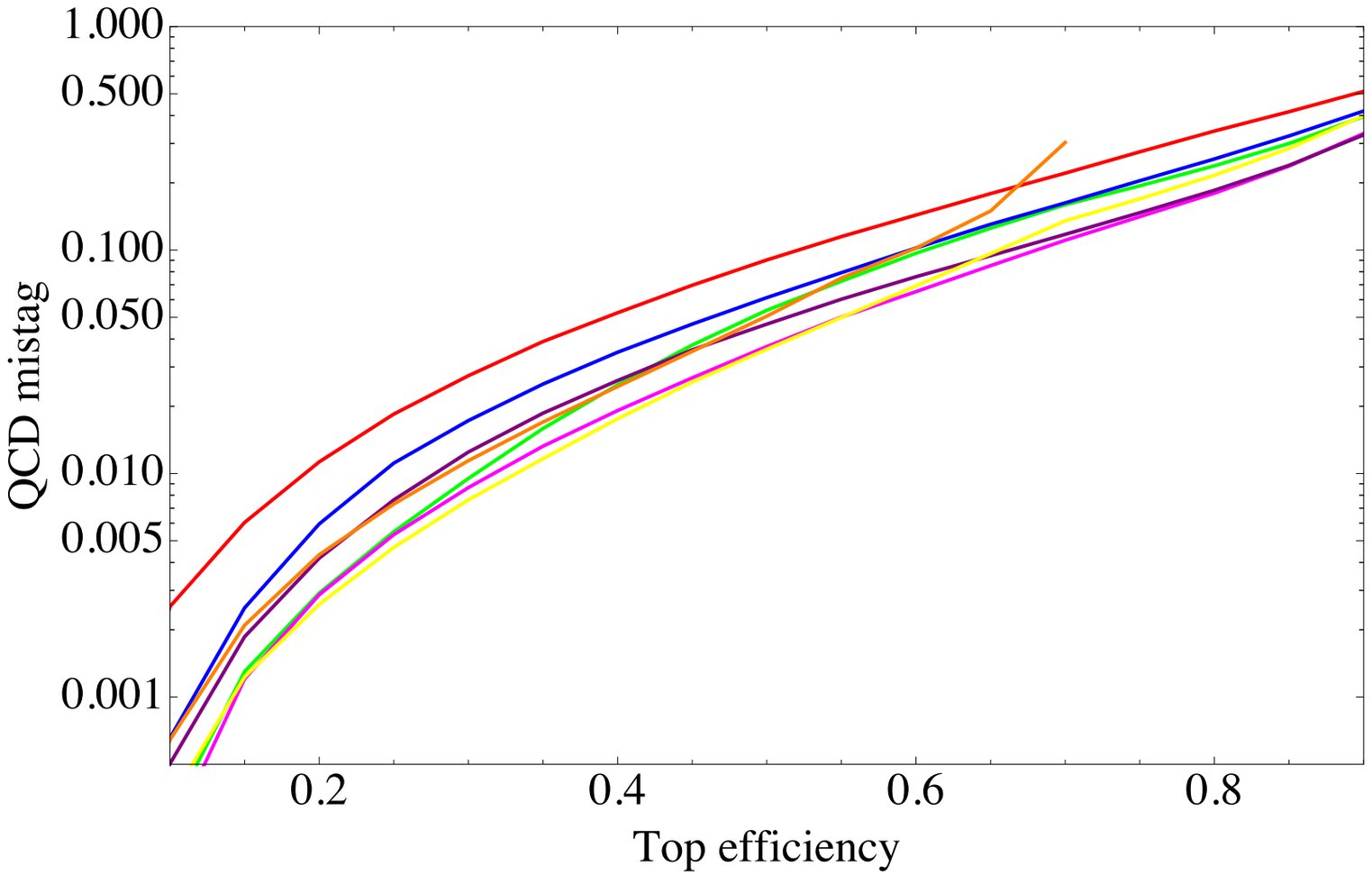

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pT = 600-700 GeV
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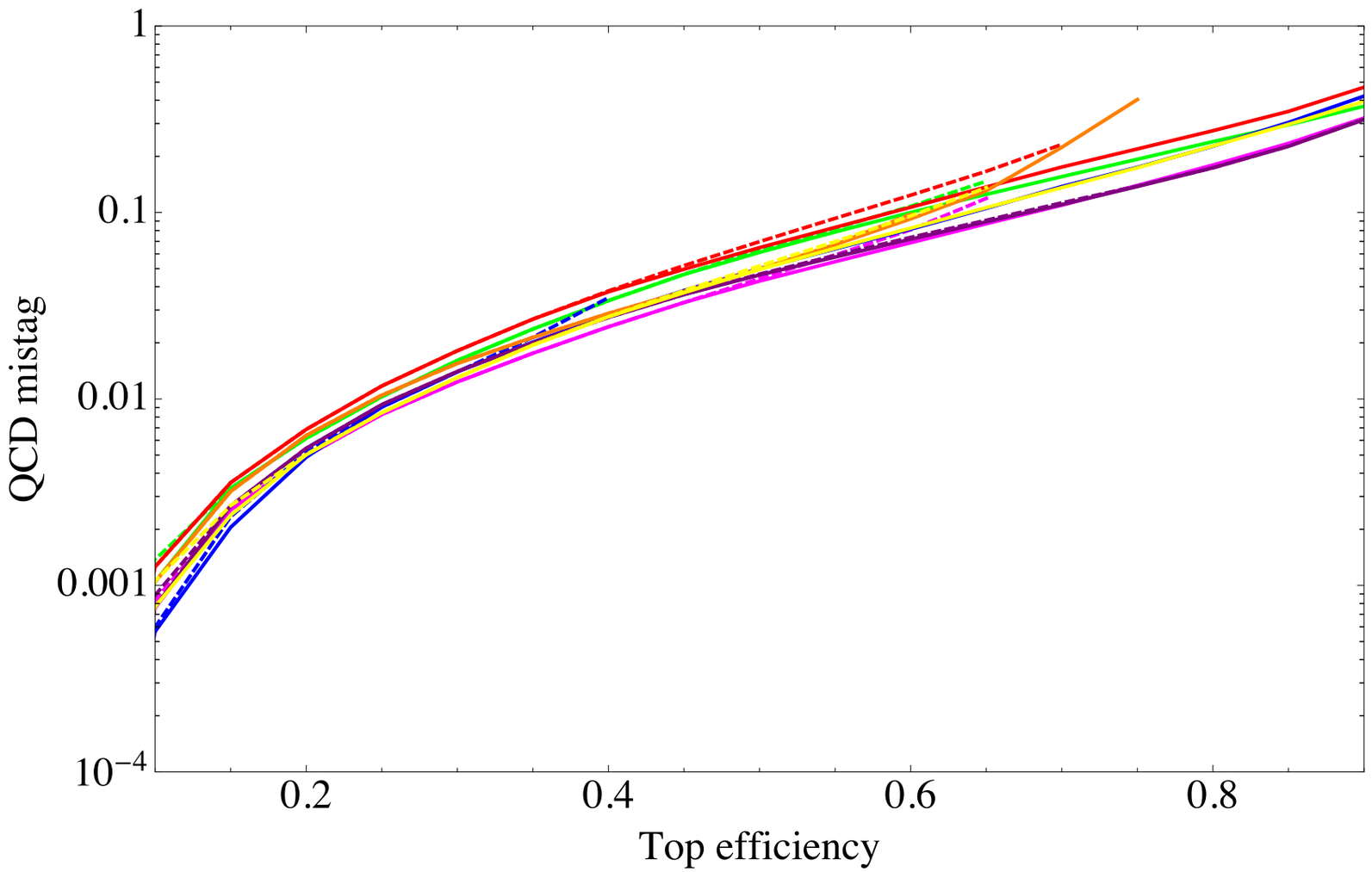
Dashed: optimized for signal efficiency of 0.3
Solid: each point optimized



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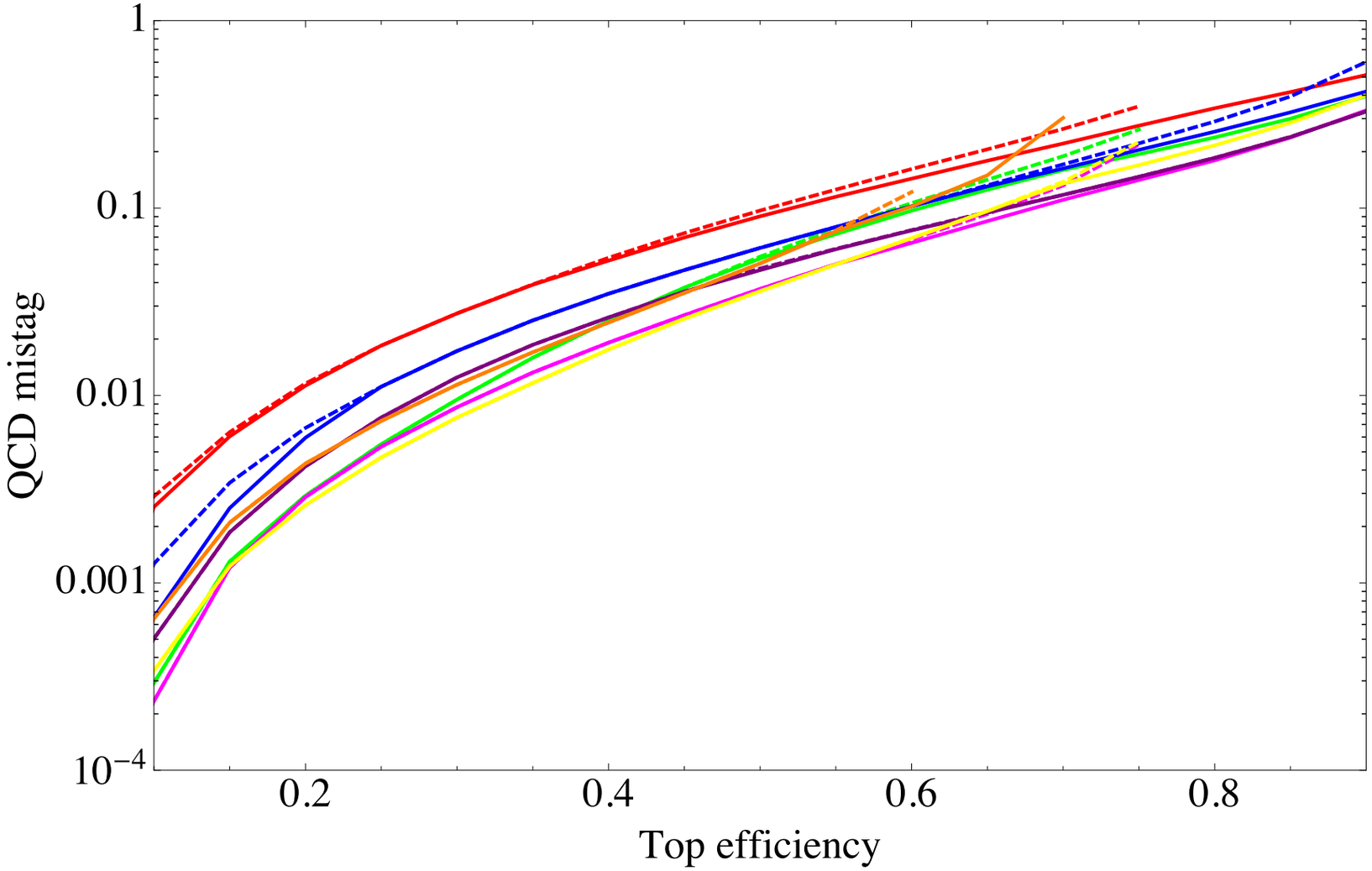

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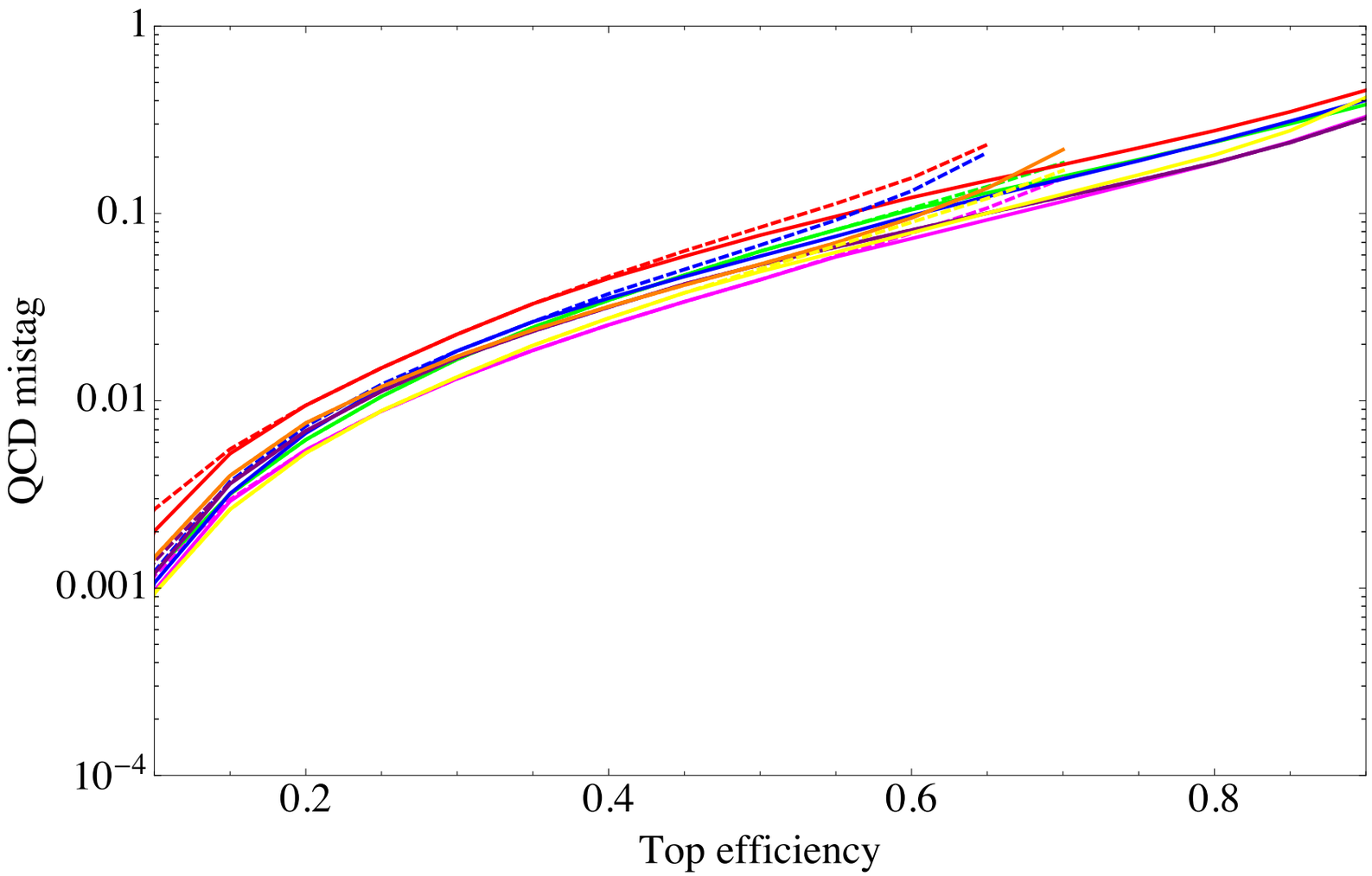

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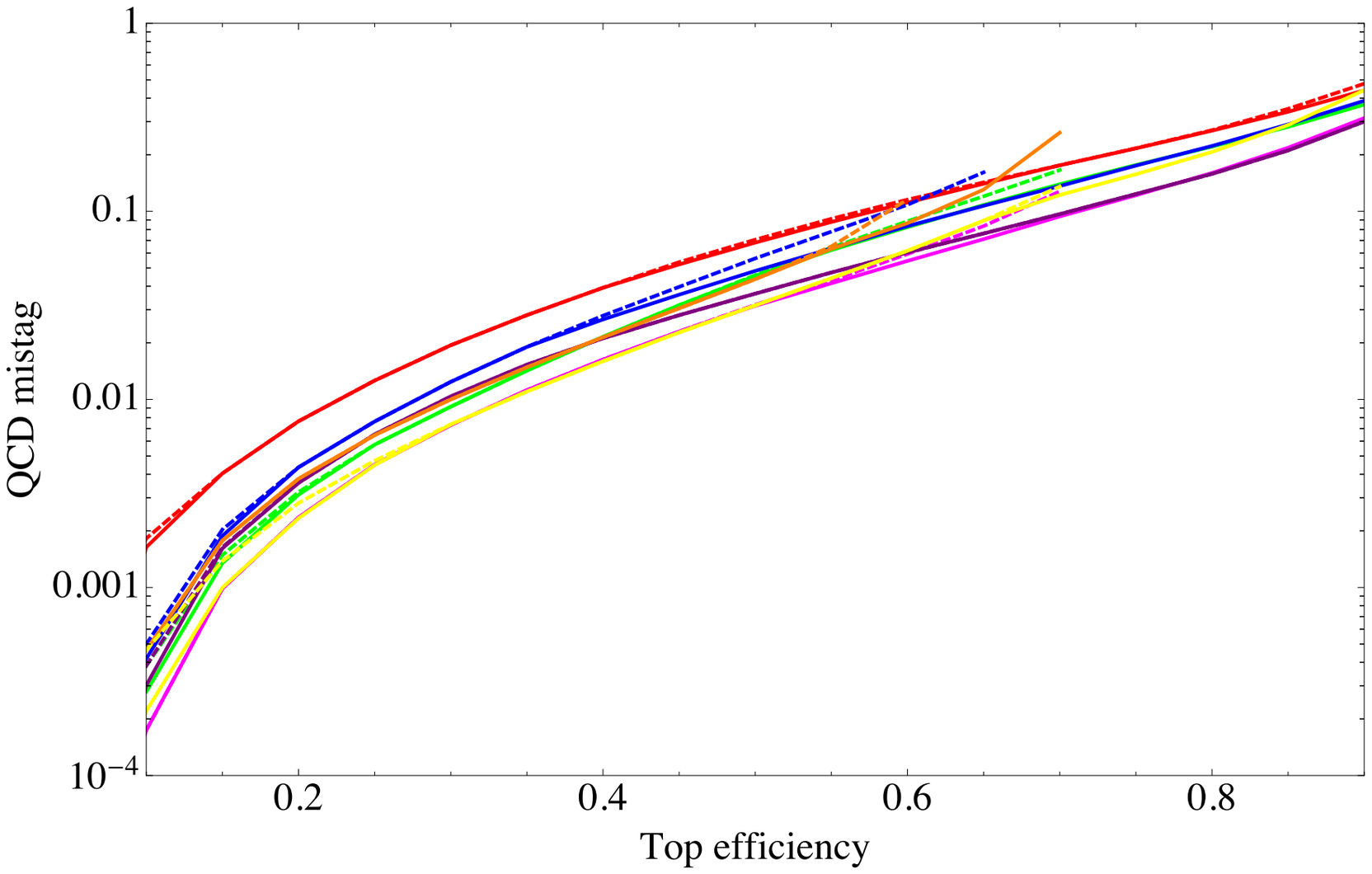

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Future steps

- Boost 2011 report: require mt > 120 GeV to avoid pathological optimization on W (will check)
- We have lots of plots -- need to decide what to present!
- Higher statistics? Other variable combinations?
- Other MC? (MG + Pythia)
- Detector effects? Pile-up?