Observations on Factoring Using the GNFS

How Do I Factor - GNFS

1. Polynomial Selection
2. Sieving
3. Combine

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2. Such that $b^d \cdot f(a/b)$ & $b^e \cdot g(a/b)$ factor 'prettily' (are smooth)
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1. Filter Relations & Build Matrix
2. Linear Algebra using Lanczos
3. "Square Root Phase"

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Slow & Unparallelizable

512 Bit ~8 Core-Days
768 Bit ~155 Core-Years*

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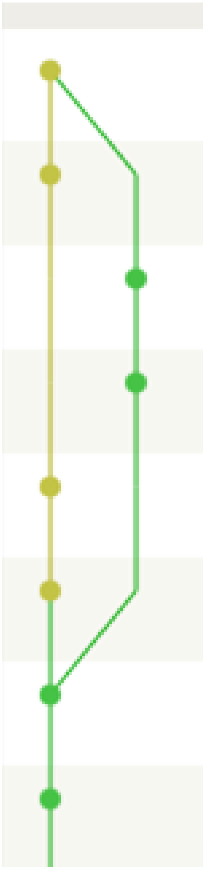
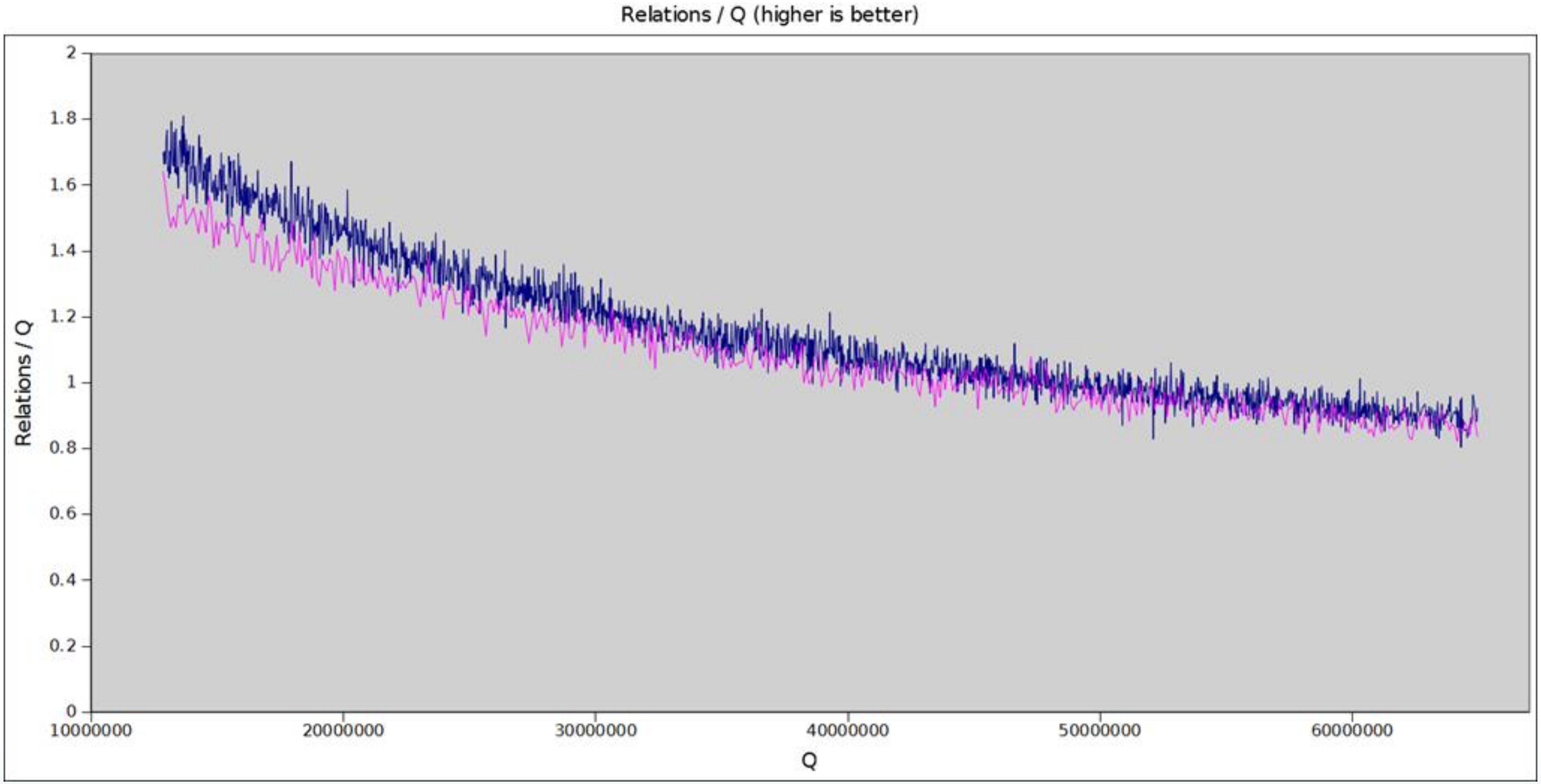
Some Details on Factoring



- Polynomial Selection
- Siever Comparisons
- Oversieving

Misconceptions about Polynomials



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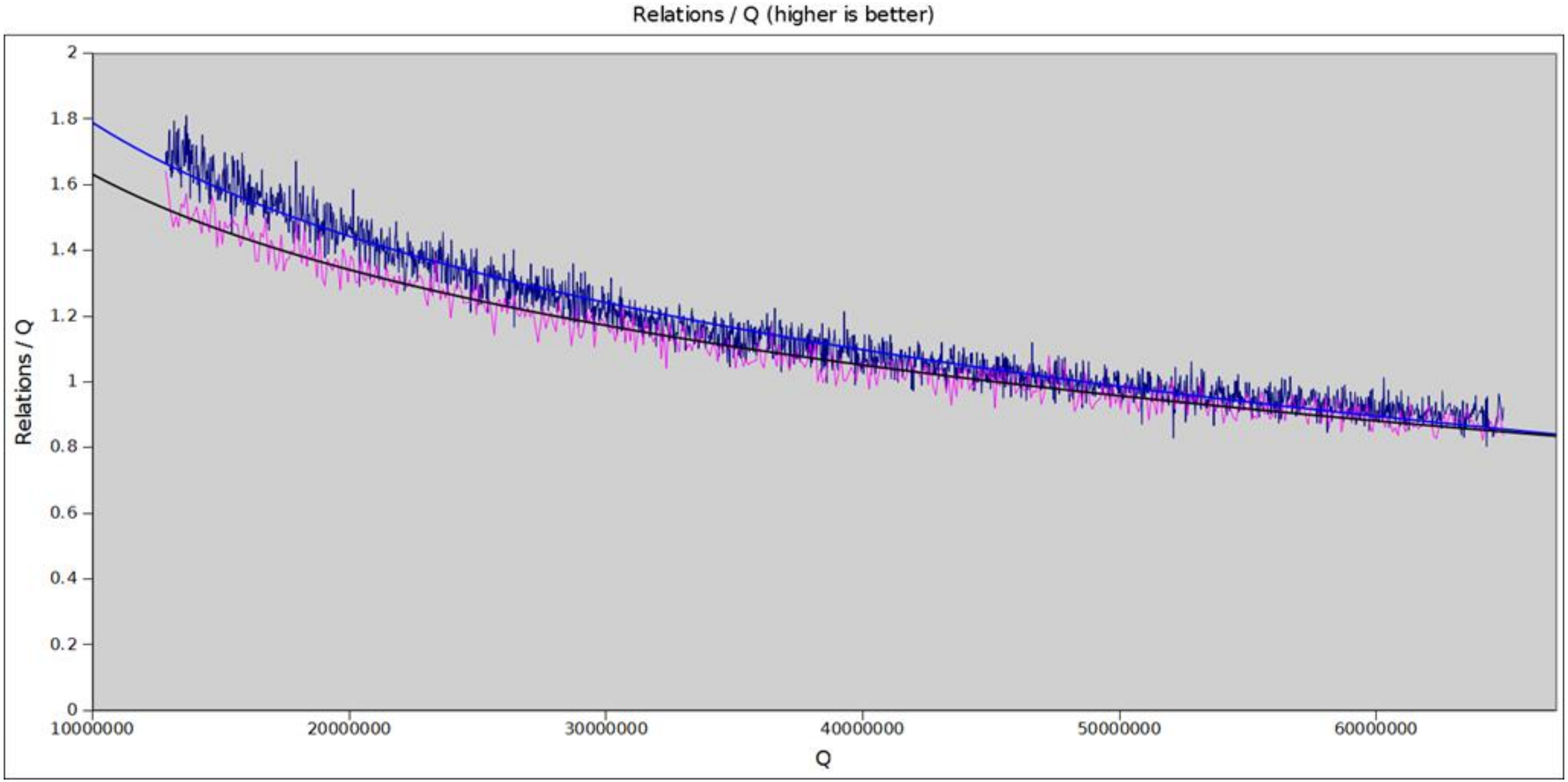

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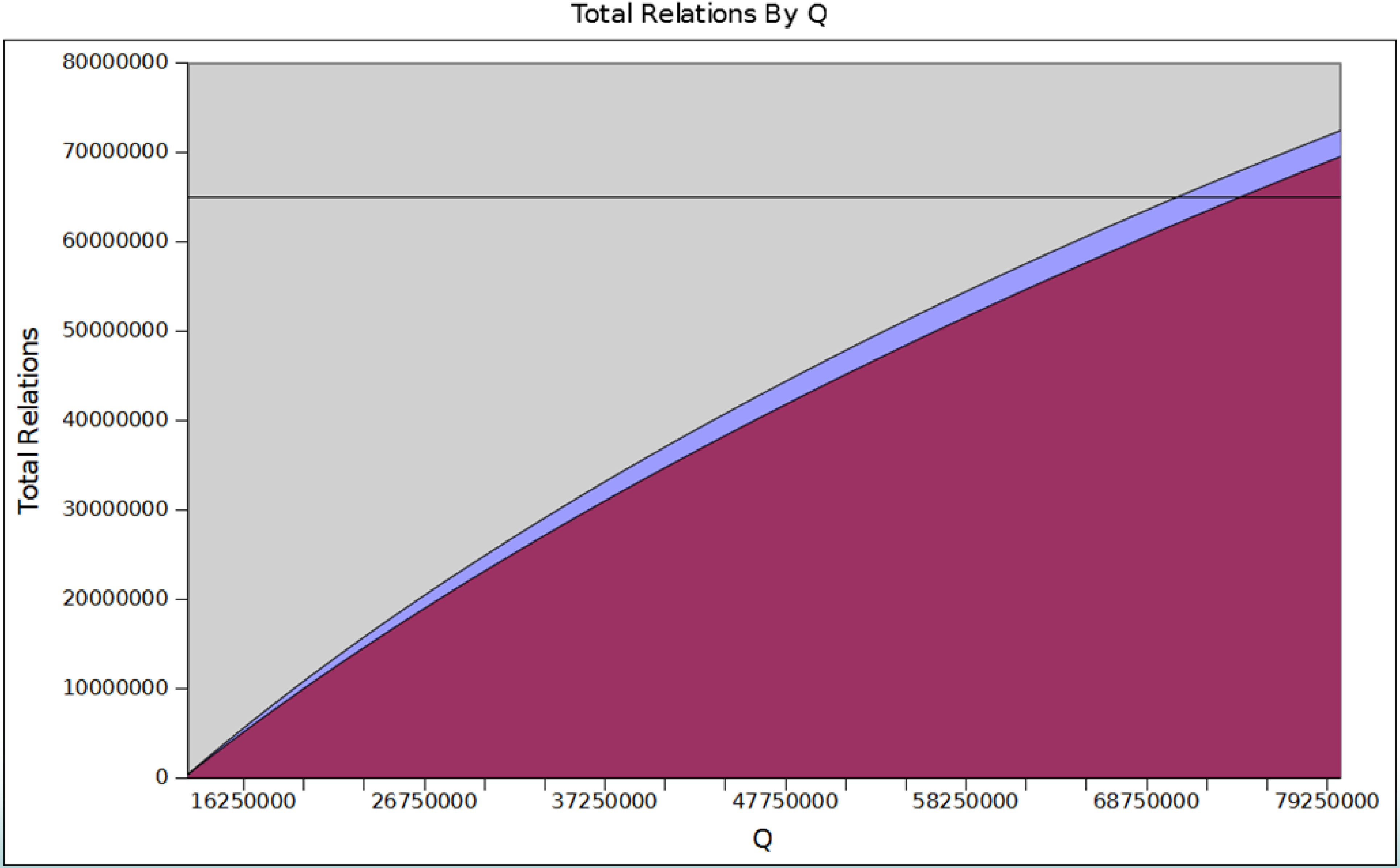

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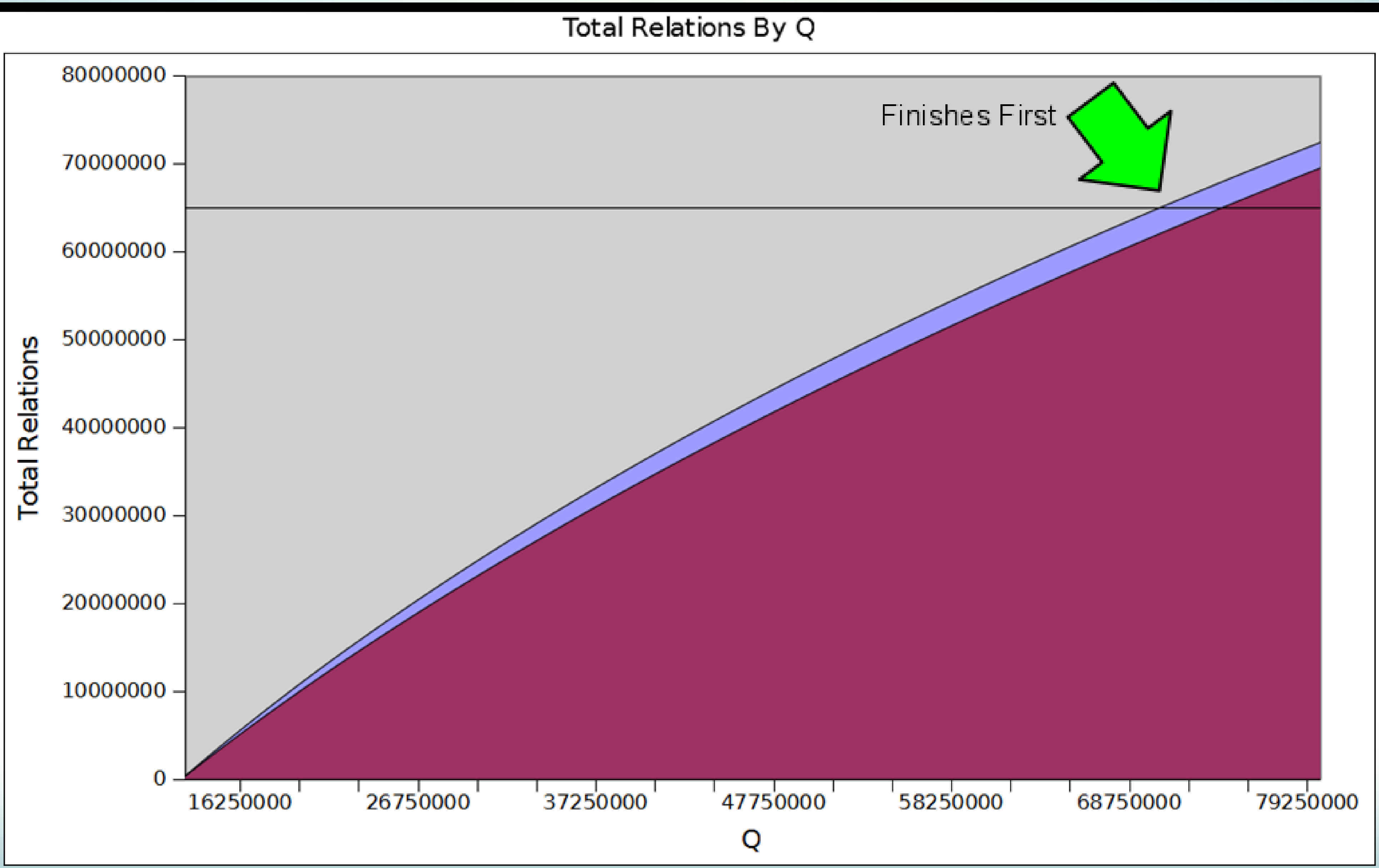

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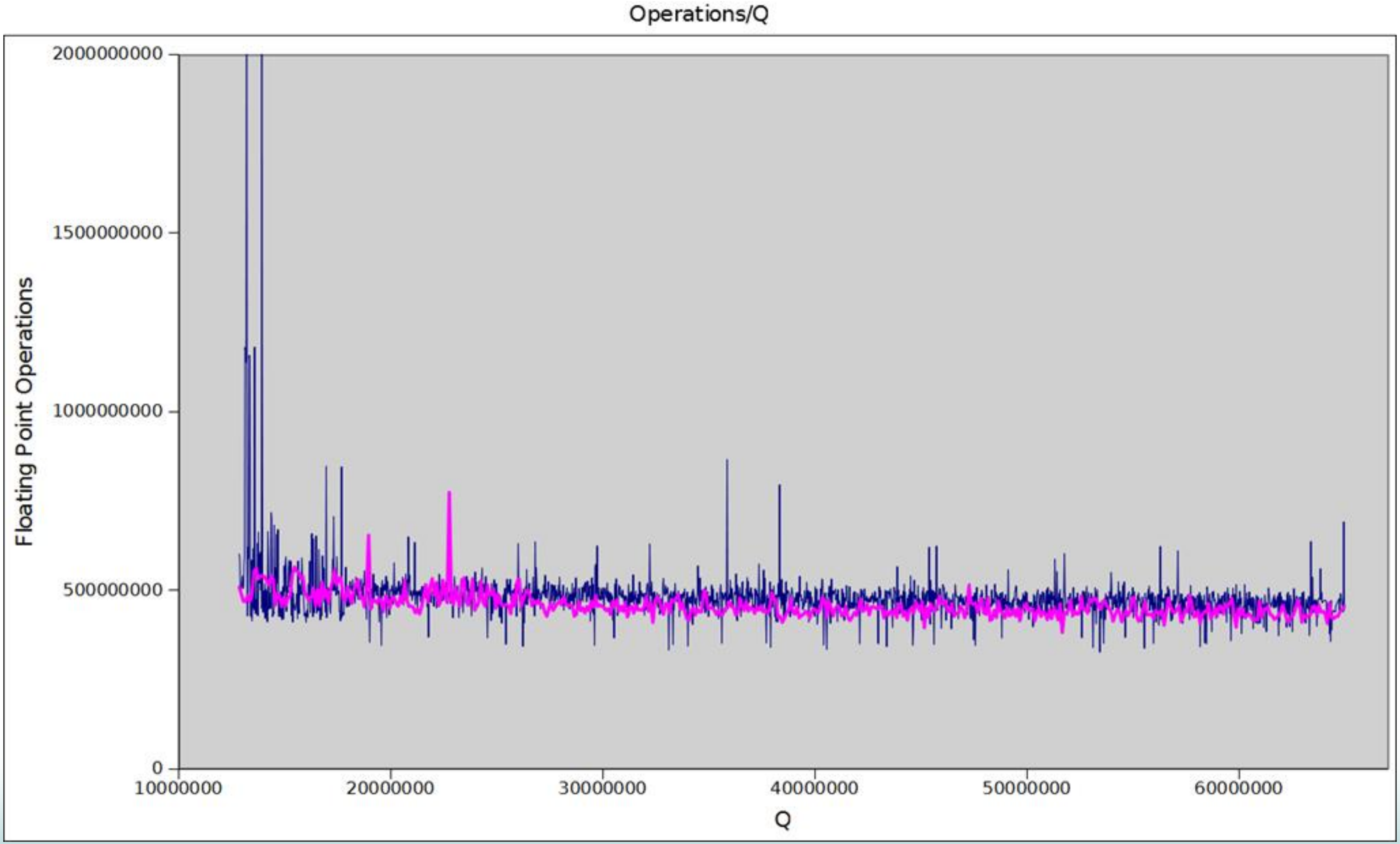

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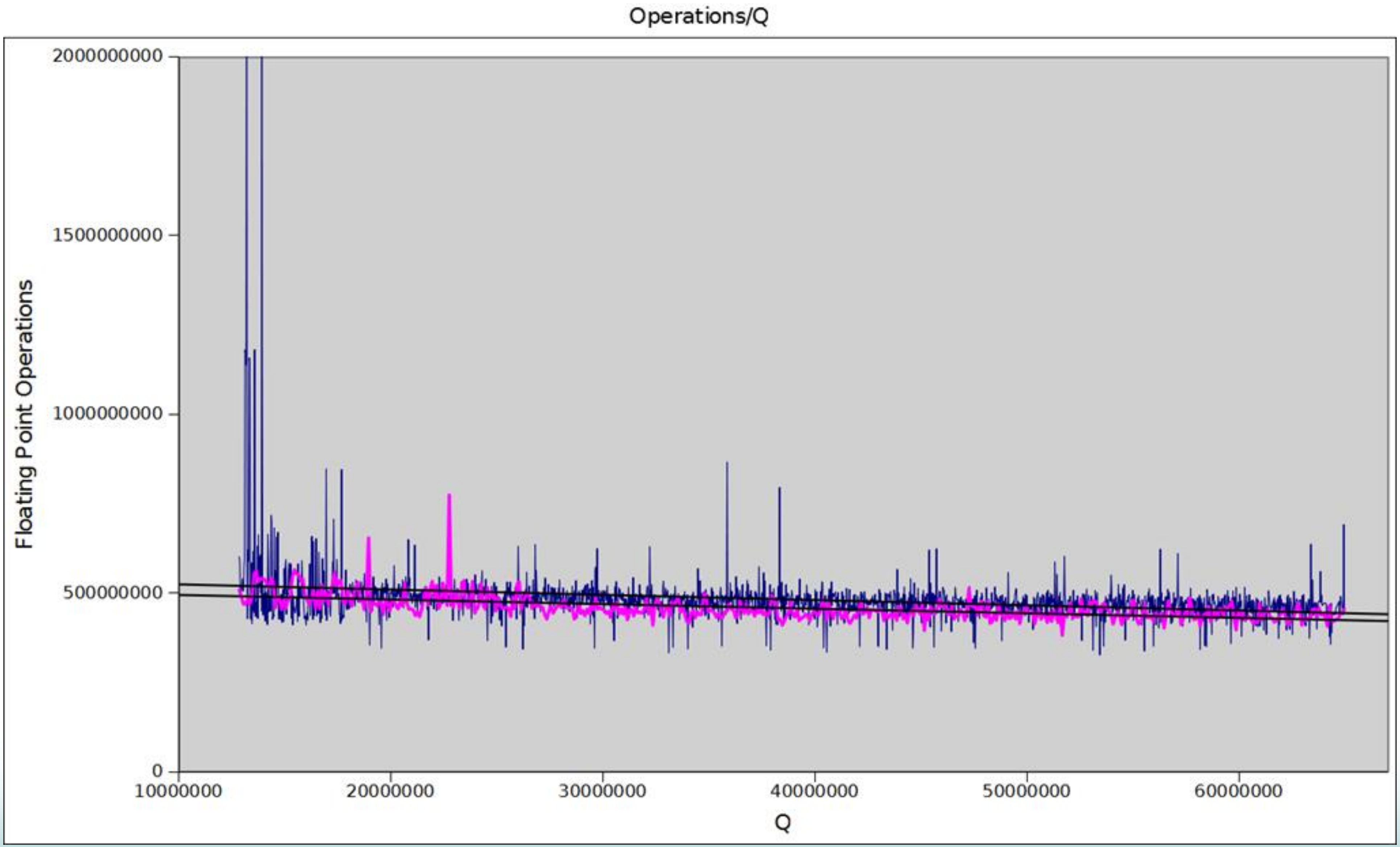

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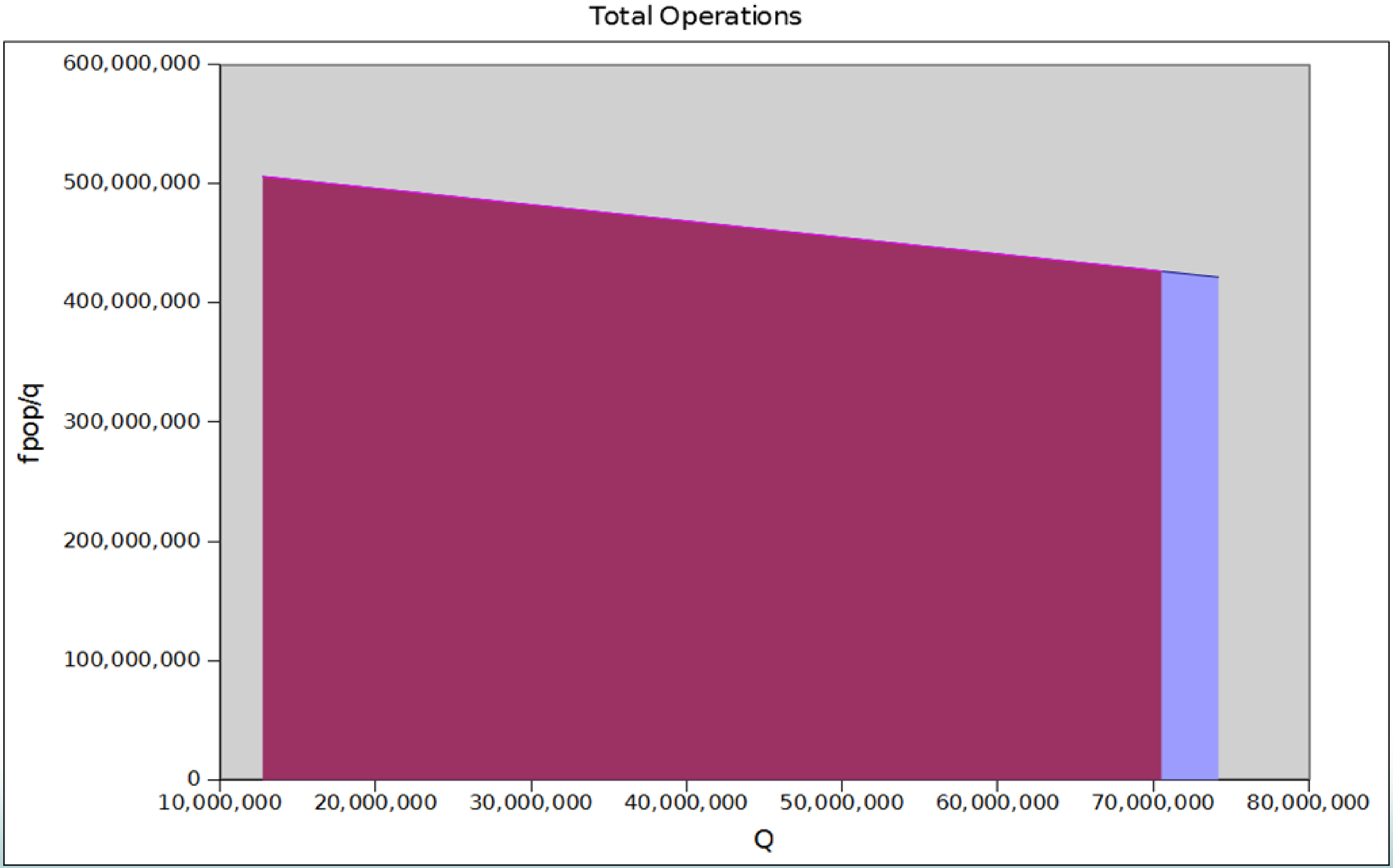

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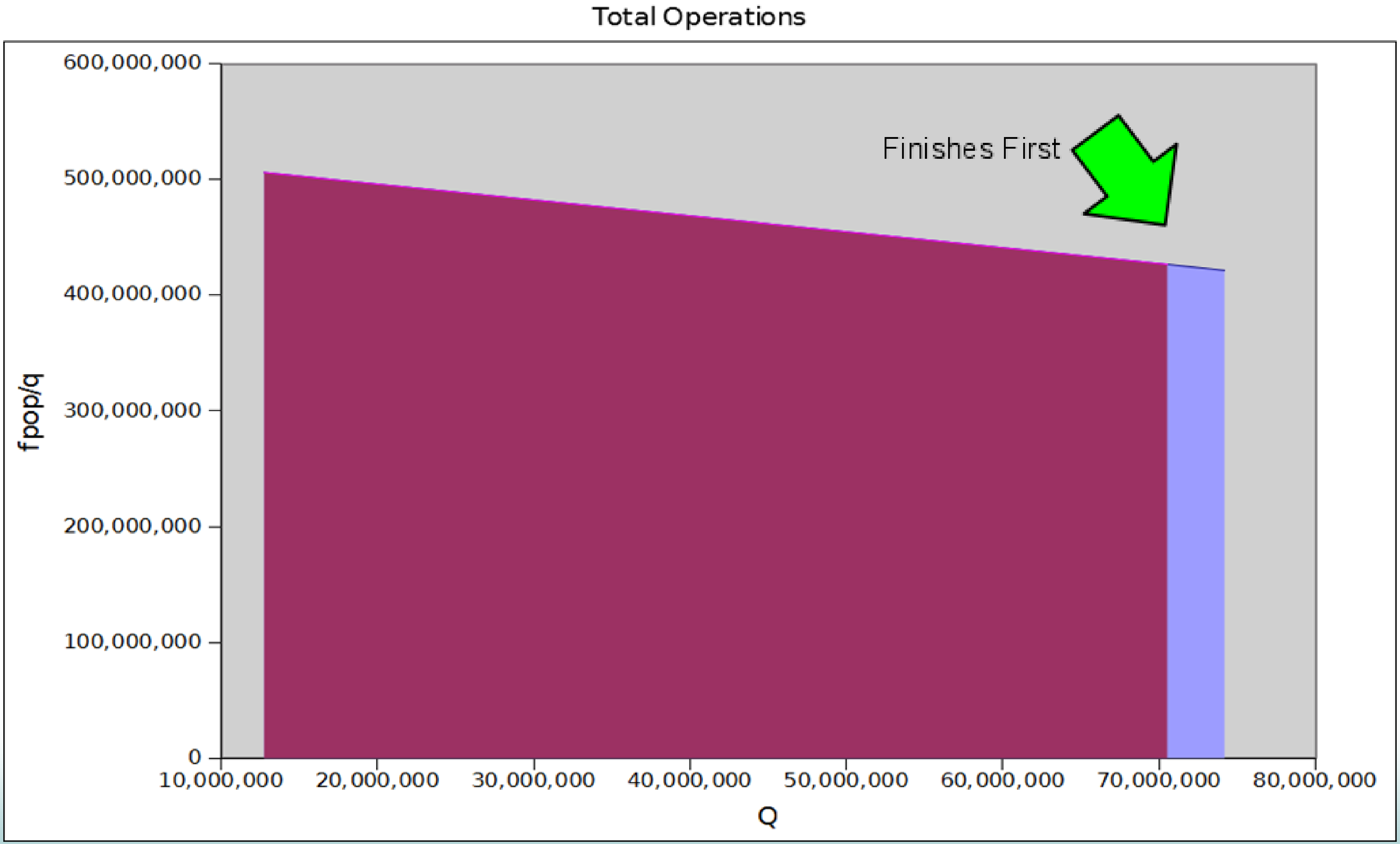

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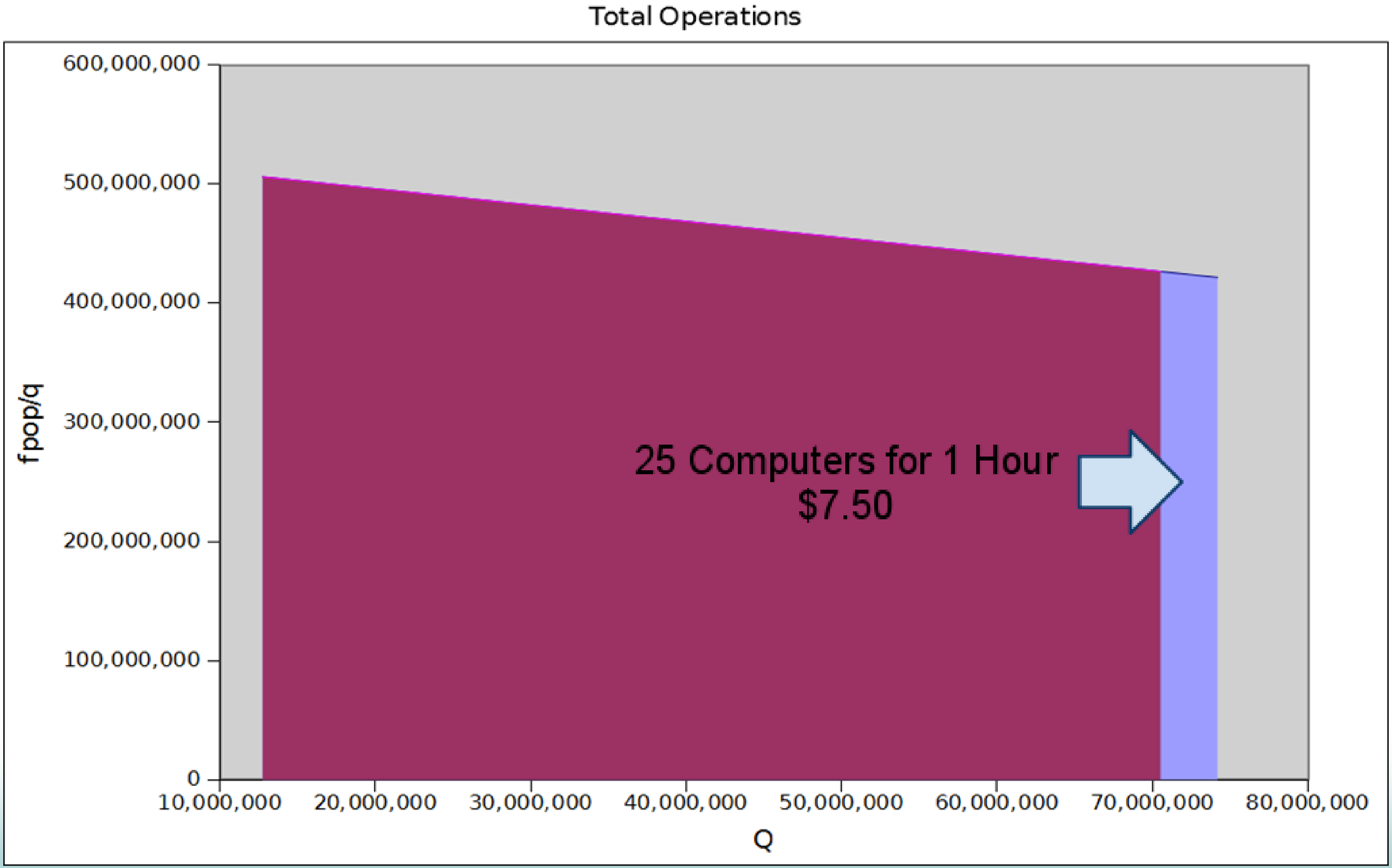
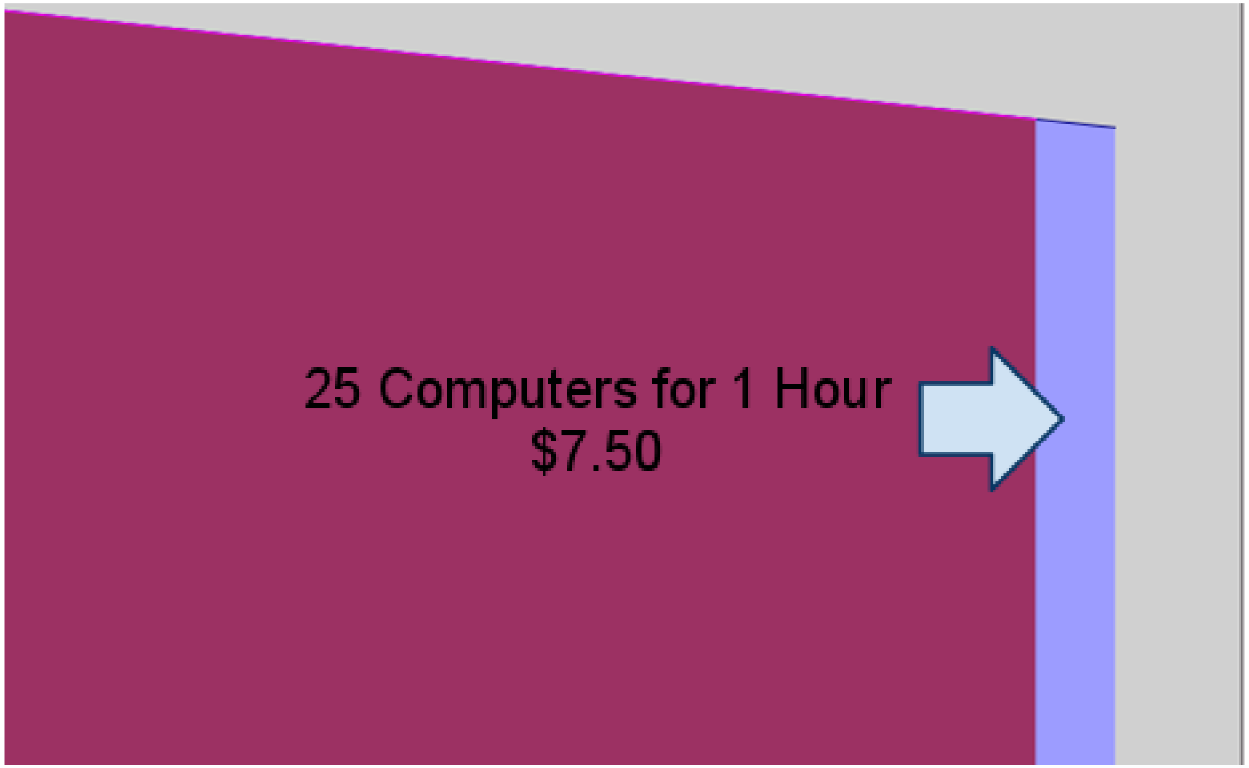


25 Computers for 1 Hour
$7.50

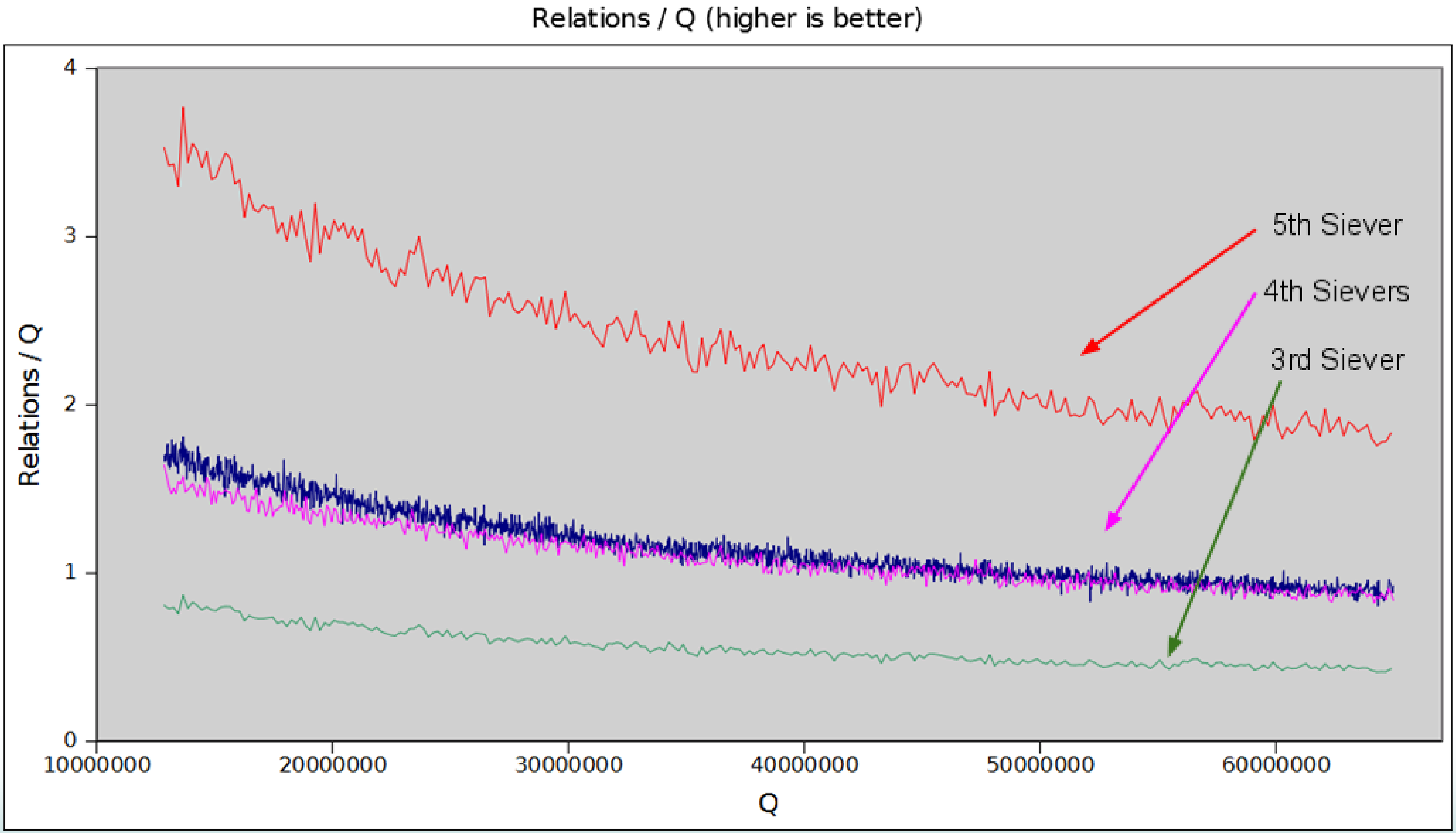
Misconceptions about Polynomials

If time is more valuable to you than (a relatively little) money it is in your best interest to take the first polynomial you get and sieve with that, rather than doing another poly-selection run.



(this advice is only
for 512-bit semiprimes.)

Siever Comparisons



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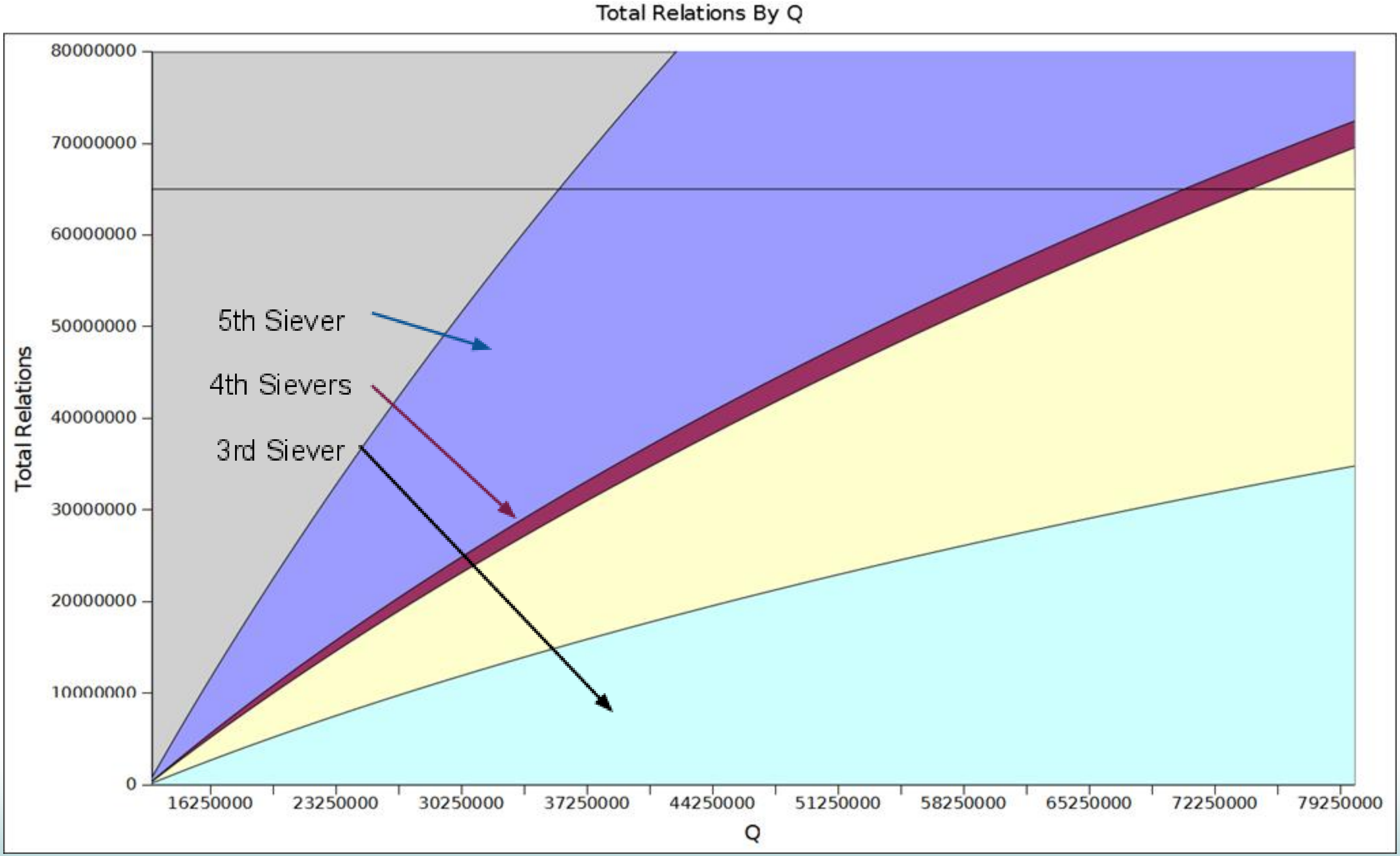
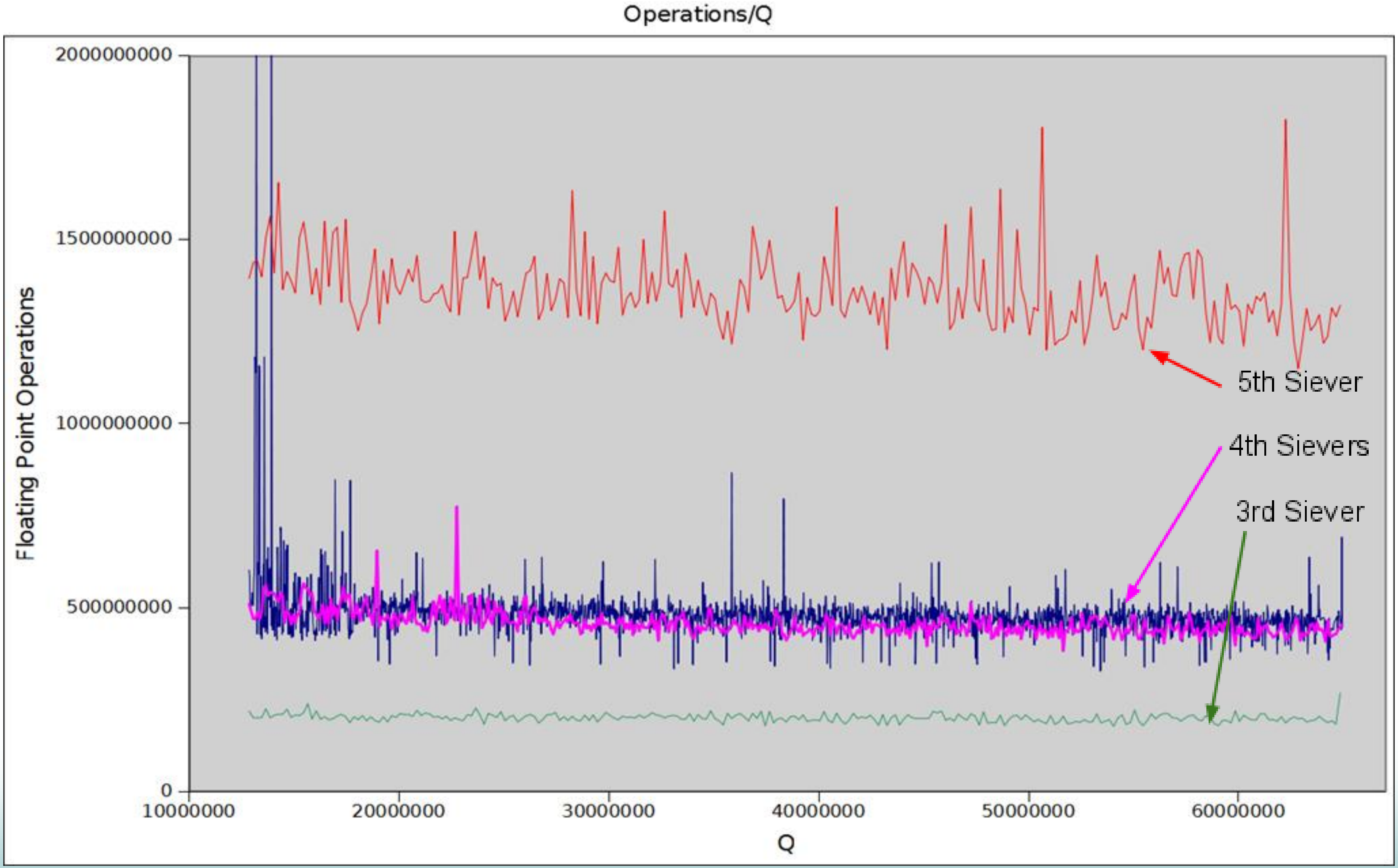


5th Siever

4th Sievers

3rd Siever

Siever Comparisons



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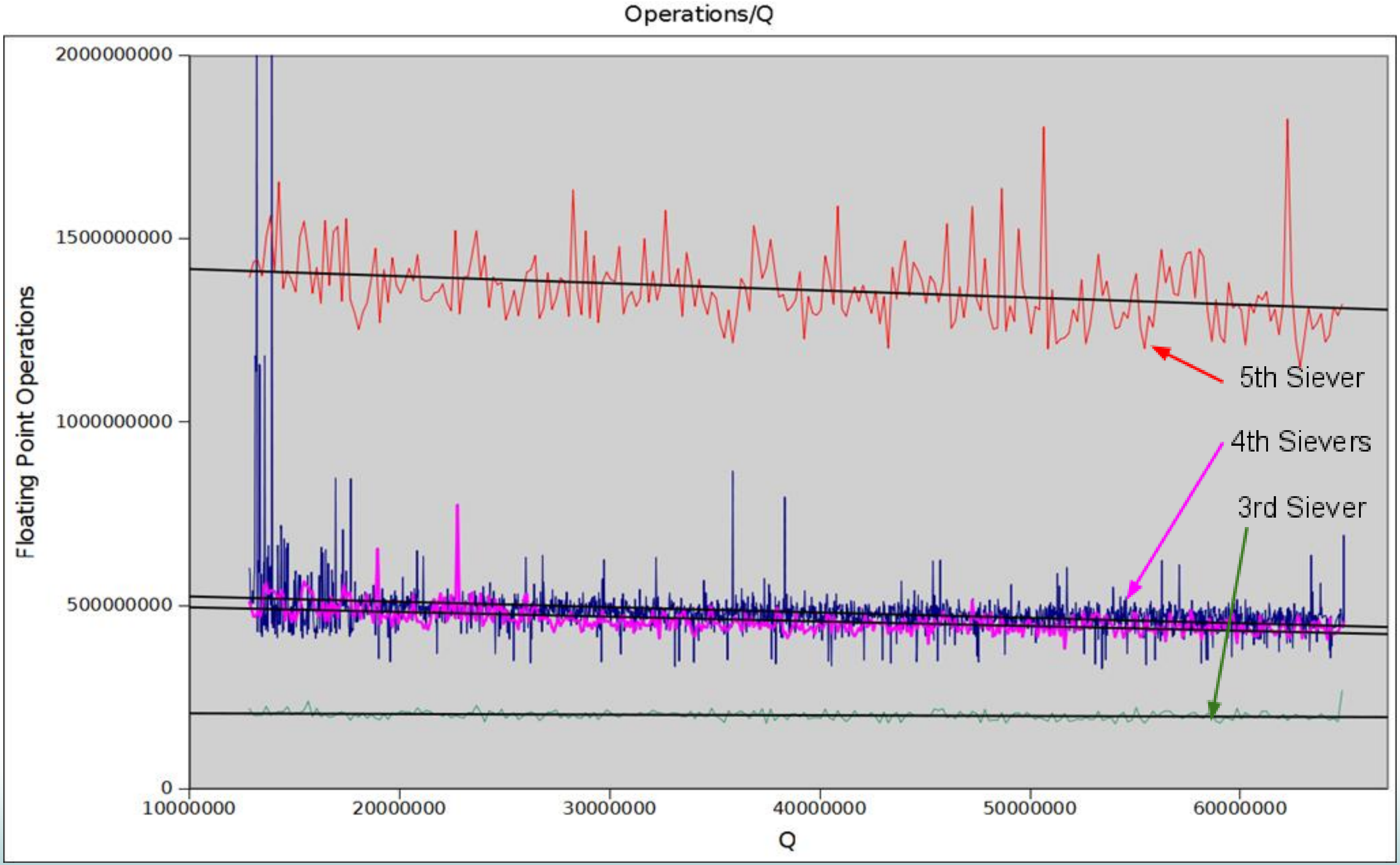

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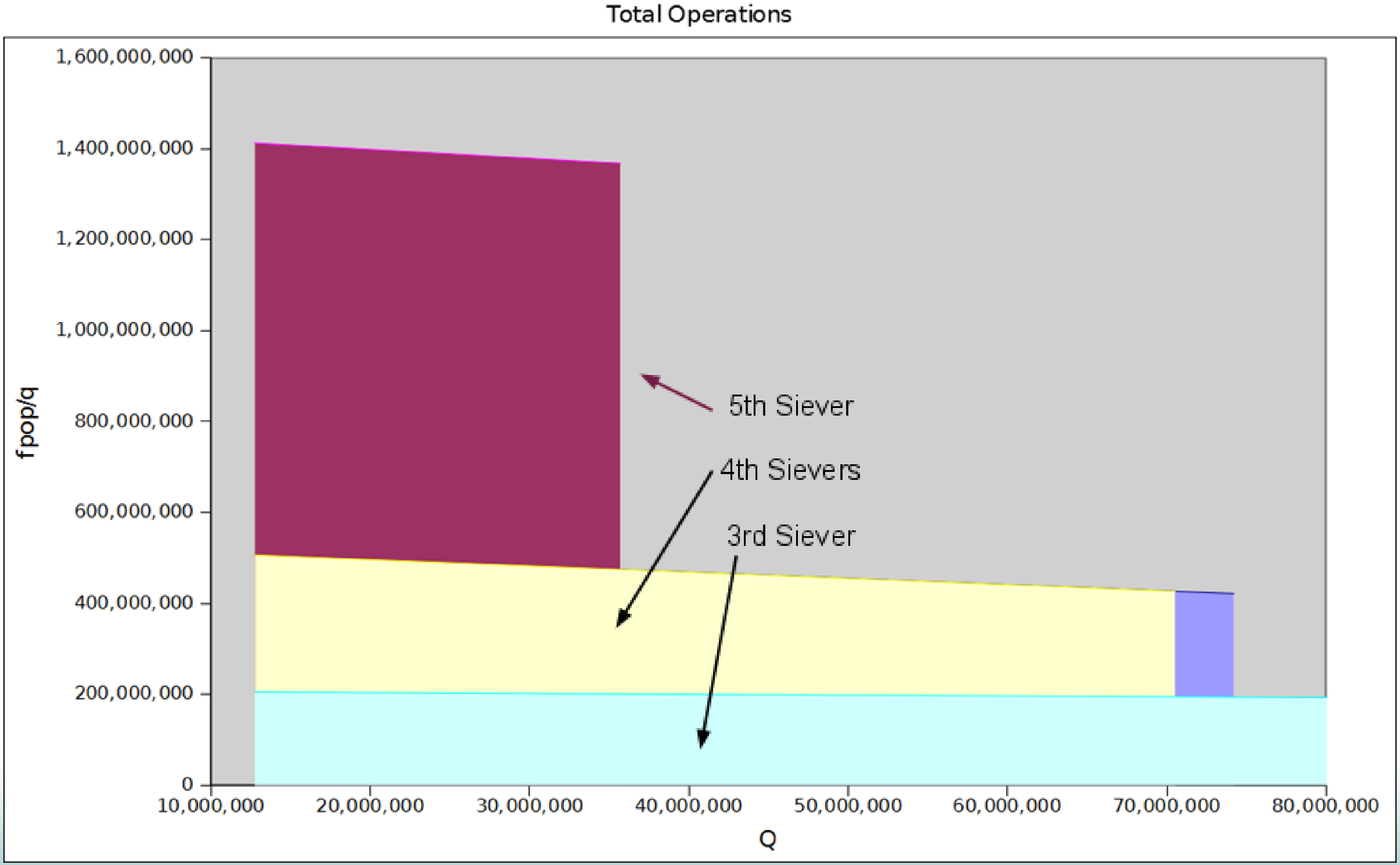

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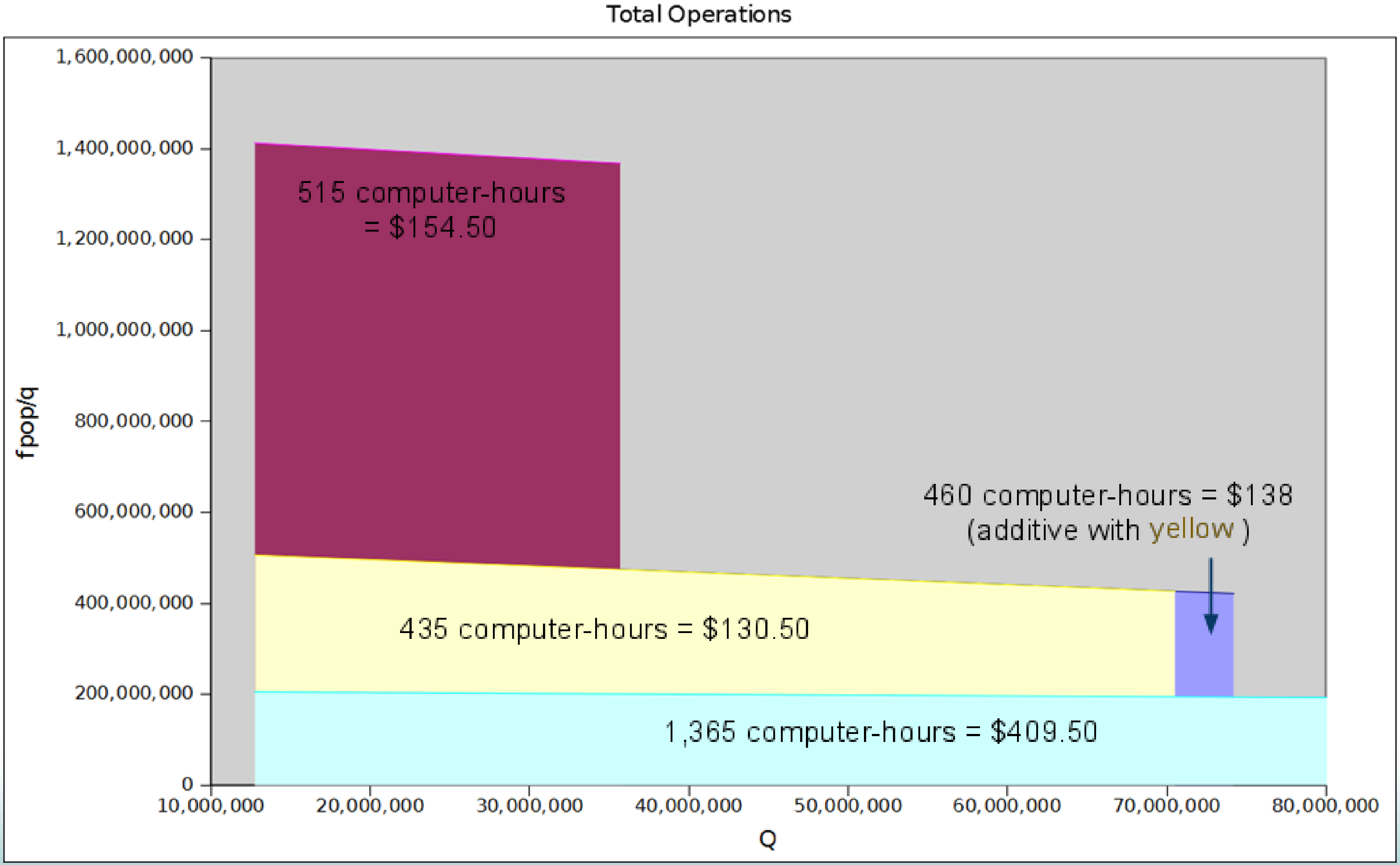
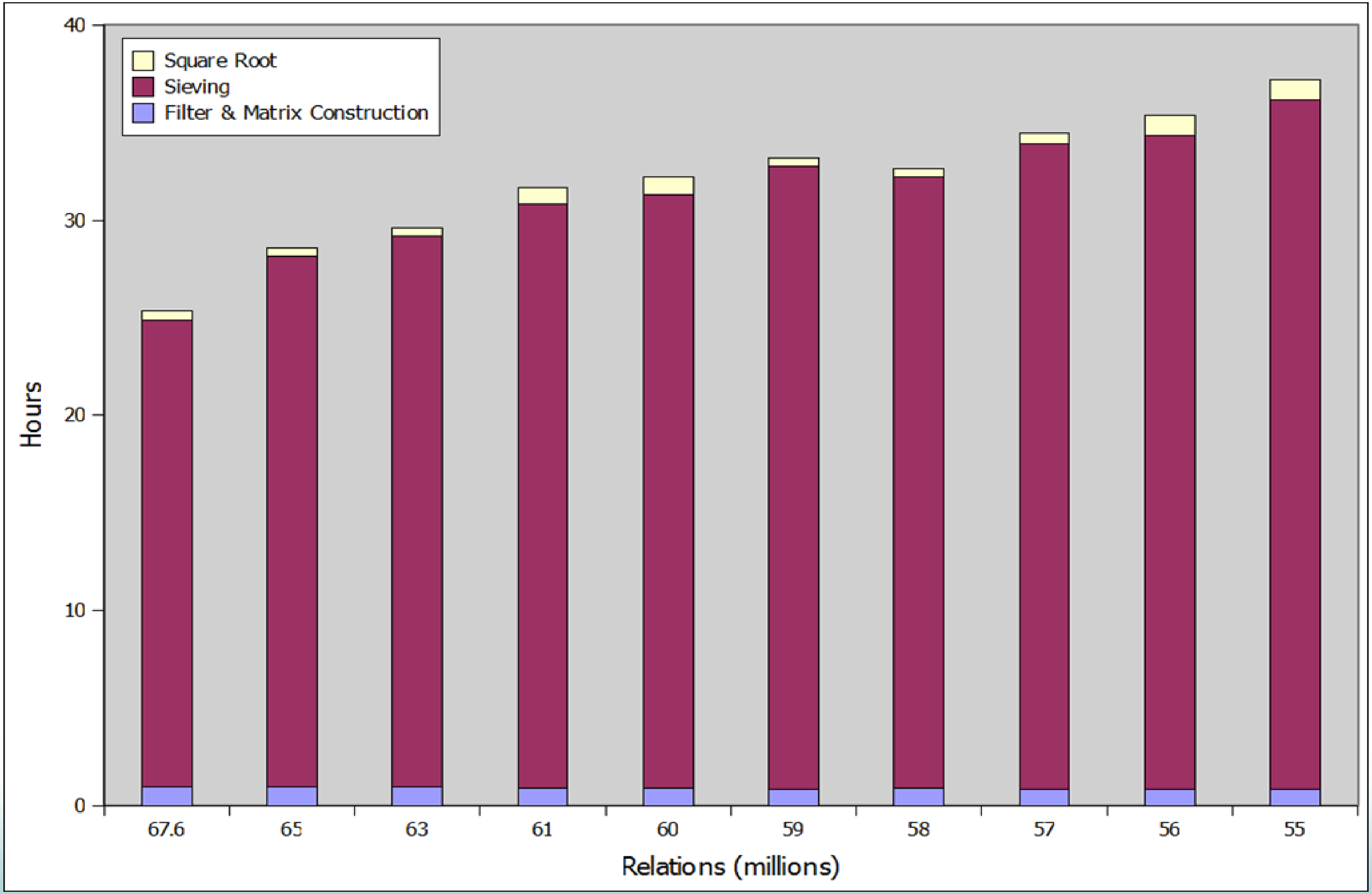


Oversieving



Obligatory Ending Slide

Fin

Thanks:

- GDS
- NYSec
- MersenneForum & jasonp

Tom Ritter
http://ritter.vg
(encrypted mail preferred)

Big Ups To:

- jasonp

http://www.gdssecurity.com/
https://github.com/GDSSecurity/cloud-and-control