New RNTuple Writing Memory Profiling

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CCE-SOP Meeting

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Measurements

- Used the mimicking framework to measure RNTuple writing memory usage

- Using
  - CMS MiniAOD file format (smallest standard format)
    - 84,000 events
  - 1 thread

- Jobs run for comparison
  - Writing TTree version
  - Writing RNTuple
  - Writing RNTuple no Buffer Write option
  - Writing RNTuple no Tail Page Optimization option
 - Reading only

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Monitoring Allocations

- CMS has a facility to measure allocation requests of a process
  - i.e. memory sizes passed to malloc, new, etc.

- RNTuple compared to TTree
  - subtracting memory from Source
  - base requires 5.7x more
  - no Buffer requires 2.8x more
    - ROOT developers say not to use
  - no Tail Page requires 2.6x more

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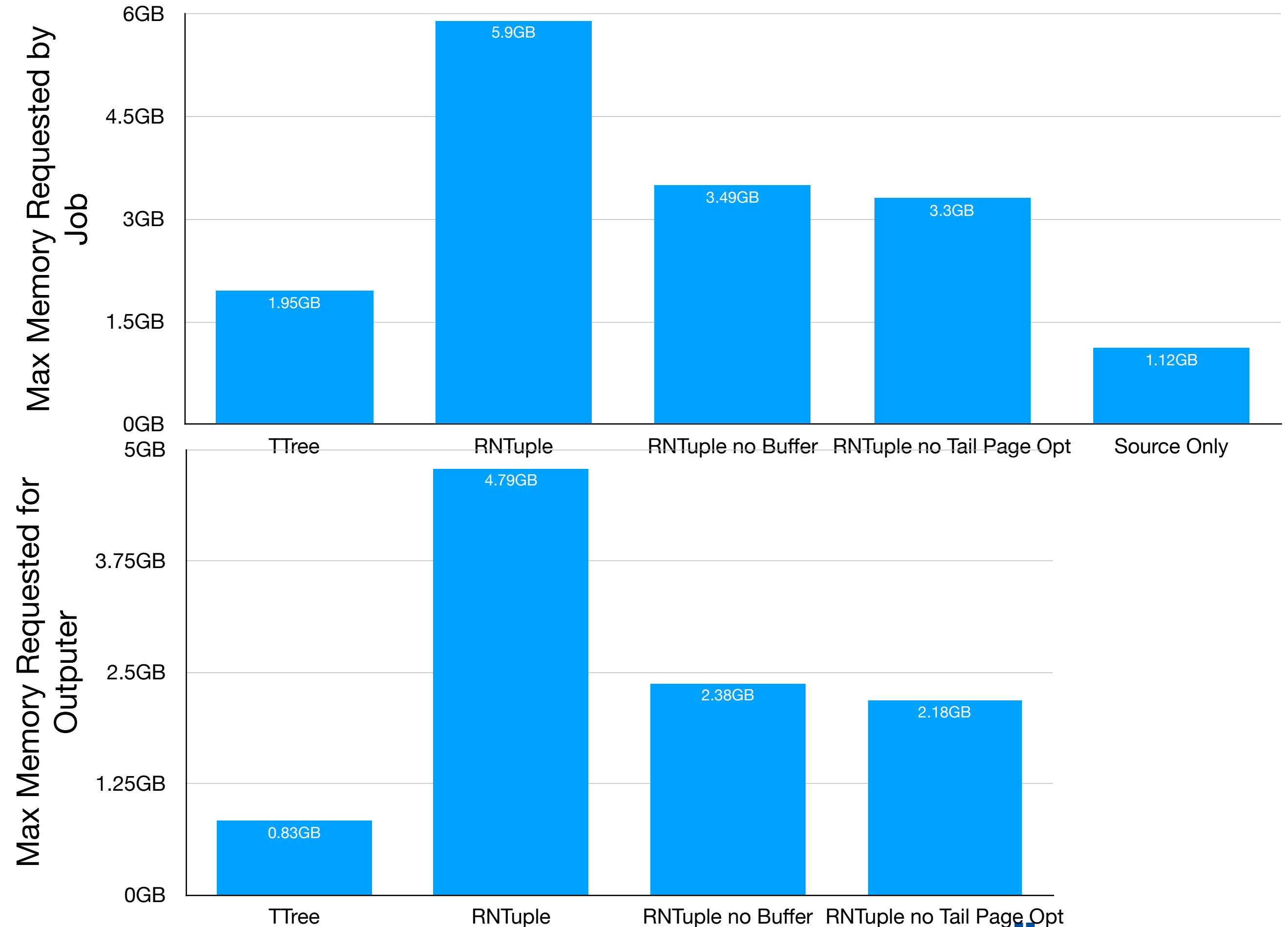
OS Memory Reporting

- Used a script to monitor RSS and VSize usage over time
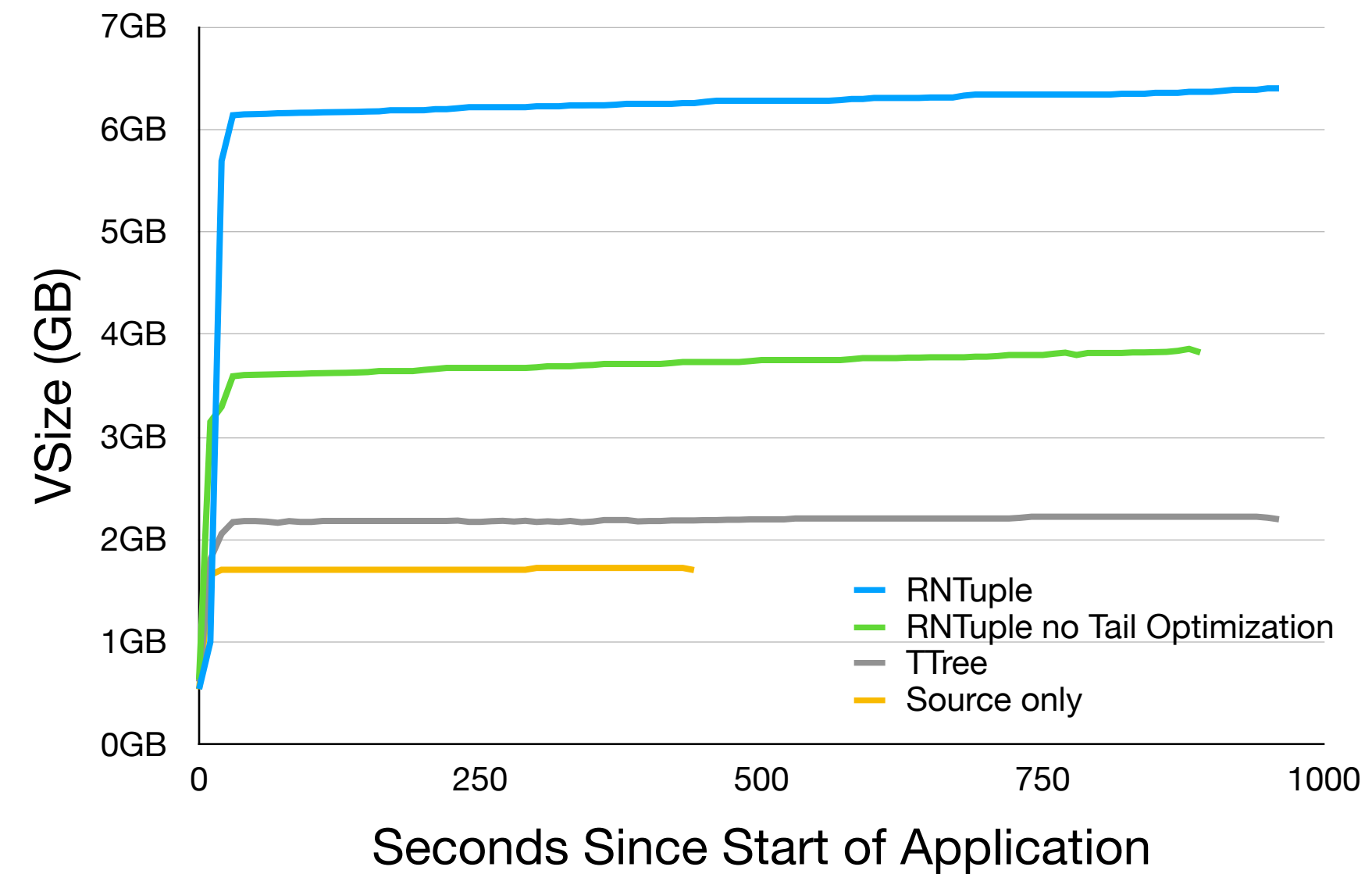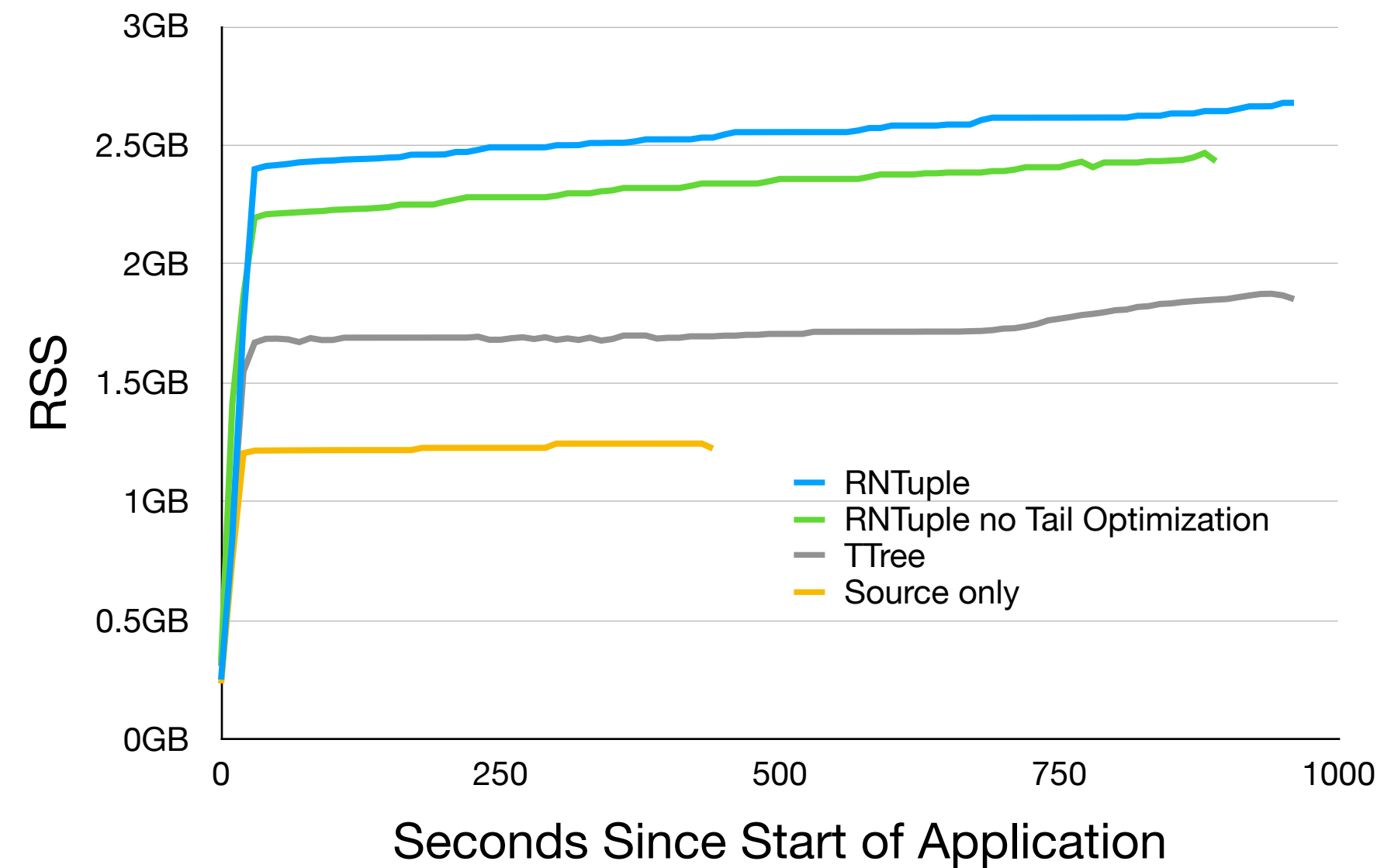
- Observations
  - Large change from RSS to VSize for RNTuple implies unused space in allocated buffers
    - removing tail page optimization was expected to decrease the unused size
  - The positive slope for RNTuple allocations is something to be investigated

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