Theia Primer

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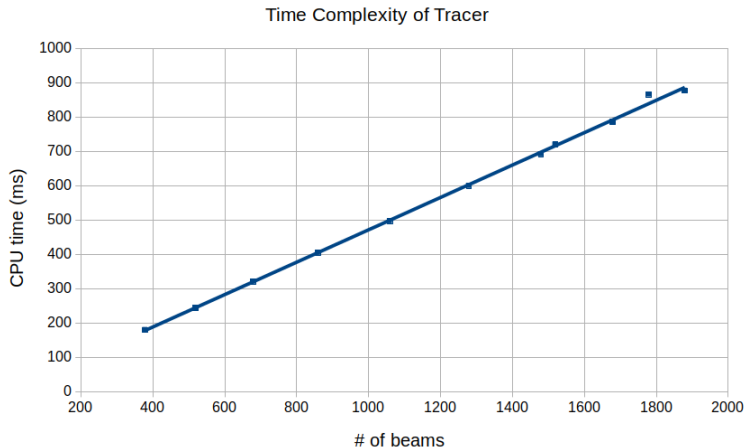
Background on astigmatic Gaussian beams

- Specify a orthonormal basis (e_z, e_1, e_2). e_1 and e_2 are principal di-

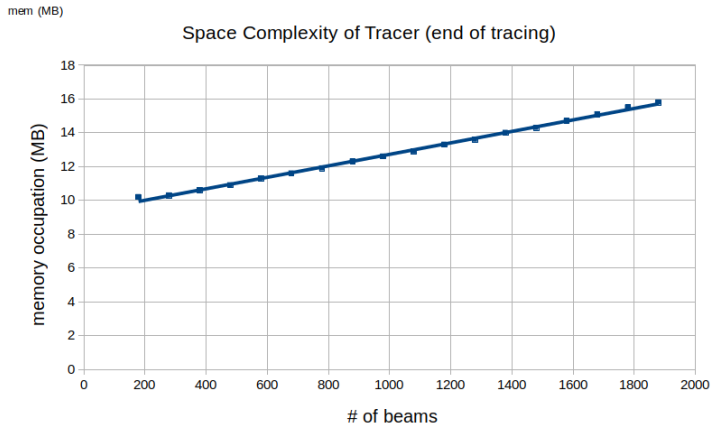# Data structures/algorithm/approximations

Demonstration

- Comparison with `OptoCAD` for 2D tracing (`telescope.py`)
- An example in 3D with spherical mirrors (`sphere.py`)

Benchmarking: time (i7/8GB)

- CPU = 0.47ms $\times$ (# beams) ($R^2 = 99.95\%$)

Benchmarking: space (i7/8GB)

Space Complexity of Tracer (end of tracing)

- Mem. $= 9{,}3$MB $+ 3{,}4$kB/beam ($R^2 = 99.76\%$)

Next steps

References

Kochkina, Wanner, Schmelzer, Tröbs, Heinzel: *Modeling of the General Astigmatic Gaussian Beam and its Propagation through 3D Optical Systems*, Applied Optics 24 (2013)

Arnaud, Kogelnik: *Gaussian Light Beams with General Astigmatism*, Applied Optics 8 (1969)