UNIVERSITÀ
DI TRENTO
Department of
Industrial Engineering

Master Thesis

8th Update

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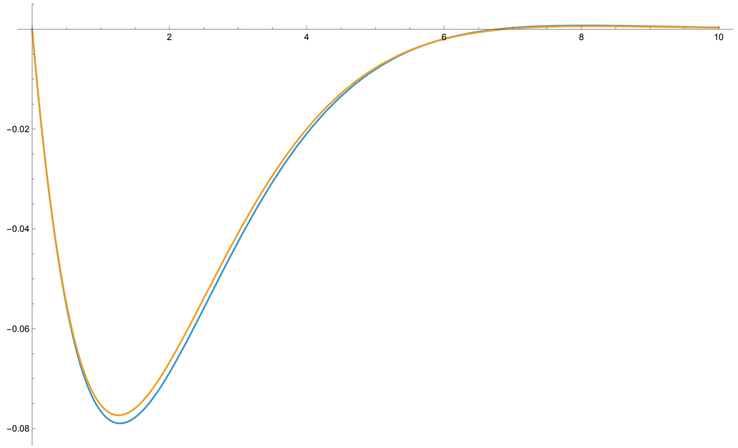
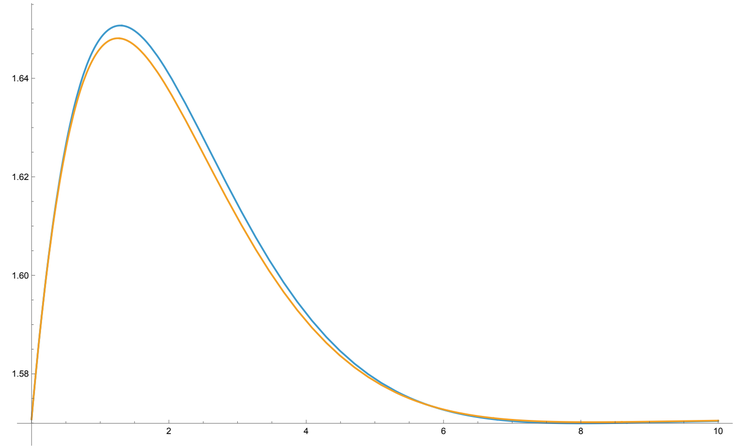
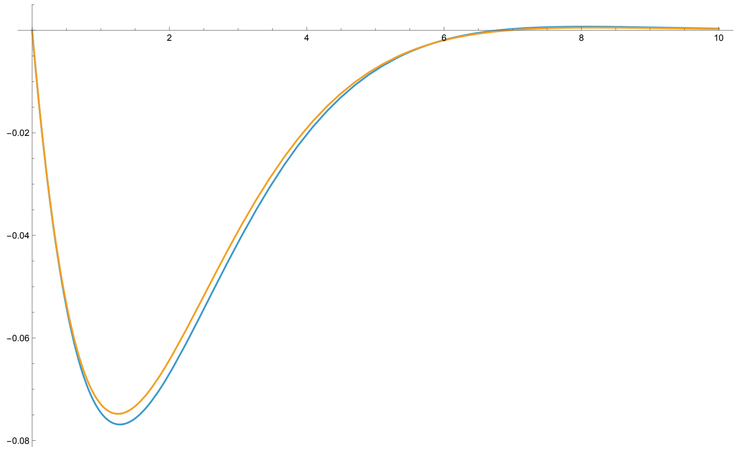
Real dynamics vs Approximated One



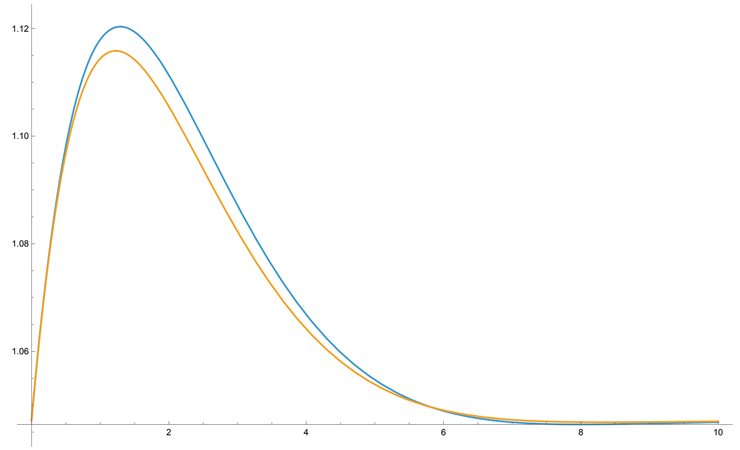
q1(t), q20 = π/2



q2(t), q20 = π/2

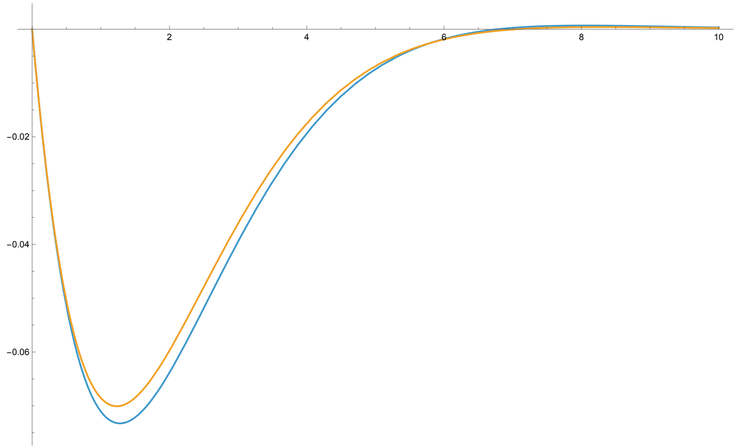


q1(t), q20 = π/3

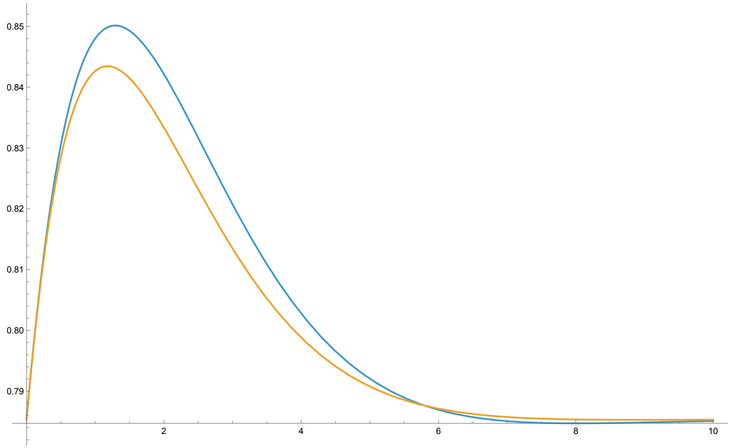


q2(t), q20 = π/3

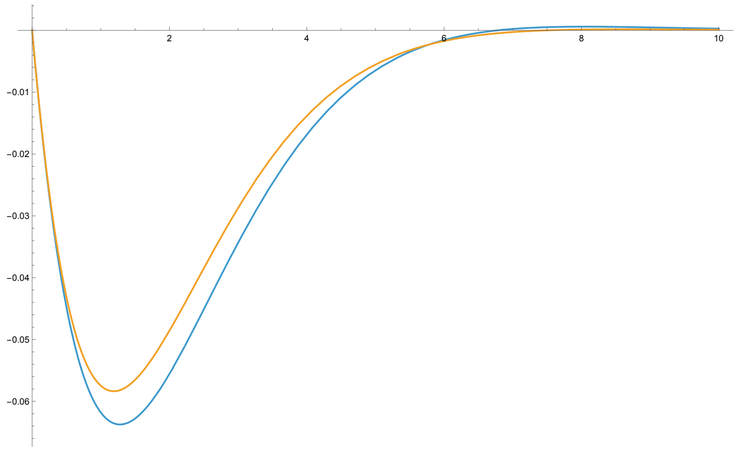
Real dynamics vs Approximated One



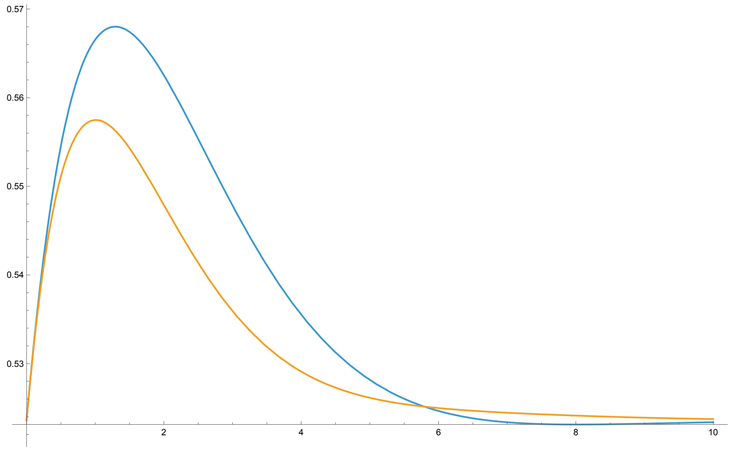
q1(t), q20 = π/4



q2(t), q20 = π/4

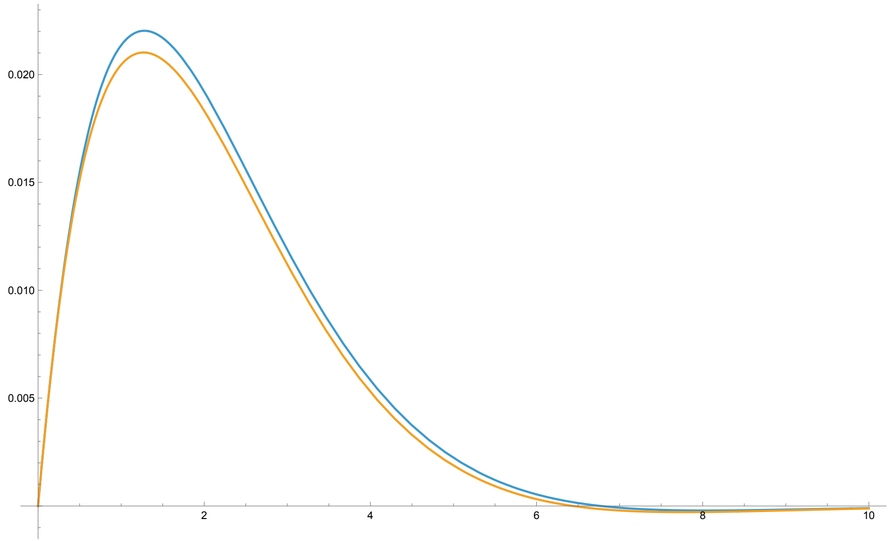


q1(t), q20 = π/6

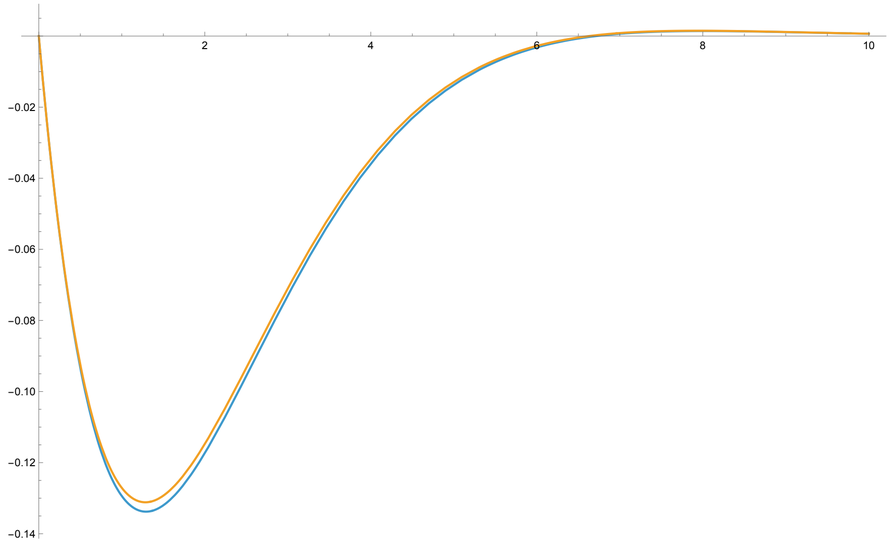


q2(t), q20 = π/6

Real dynamics vs Approximated One



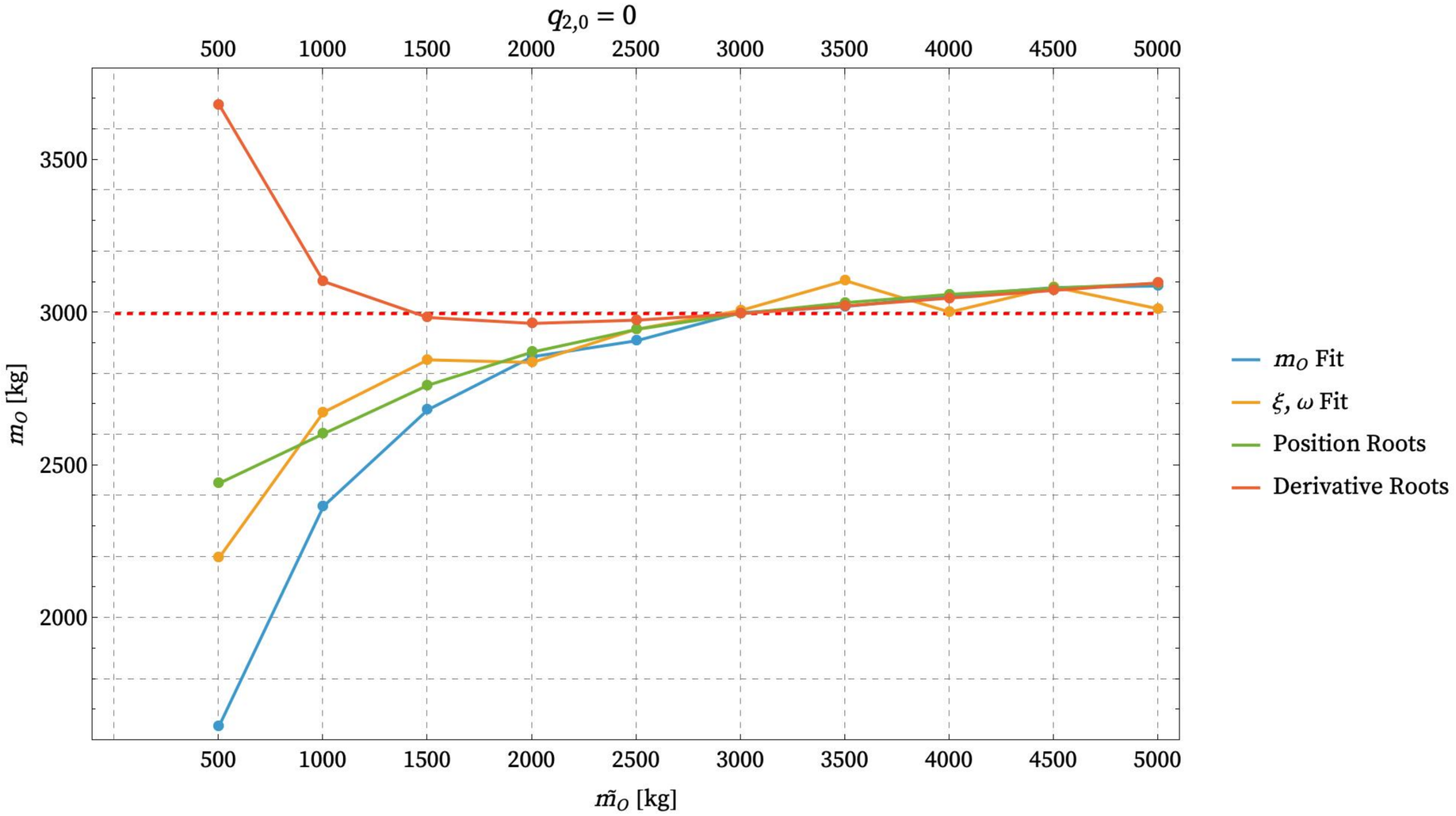
q1(t), q20 = 0



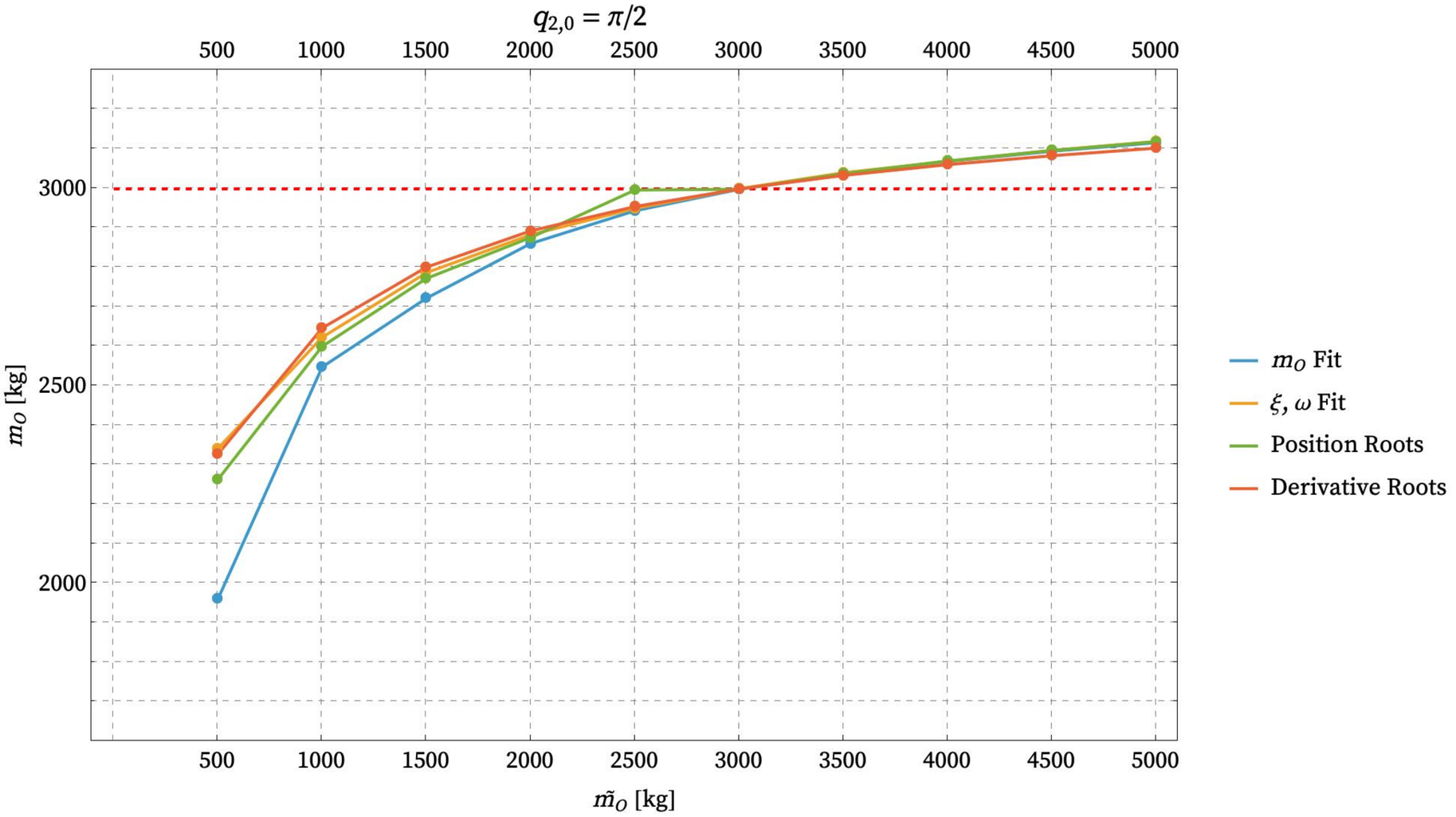
q2(t), q20 = 0

If $m_O = m$, the plots are the same

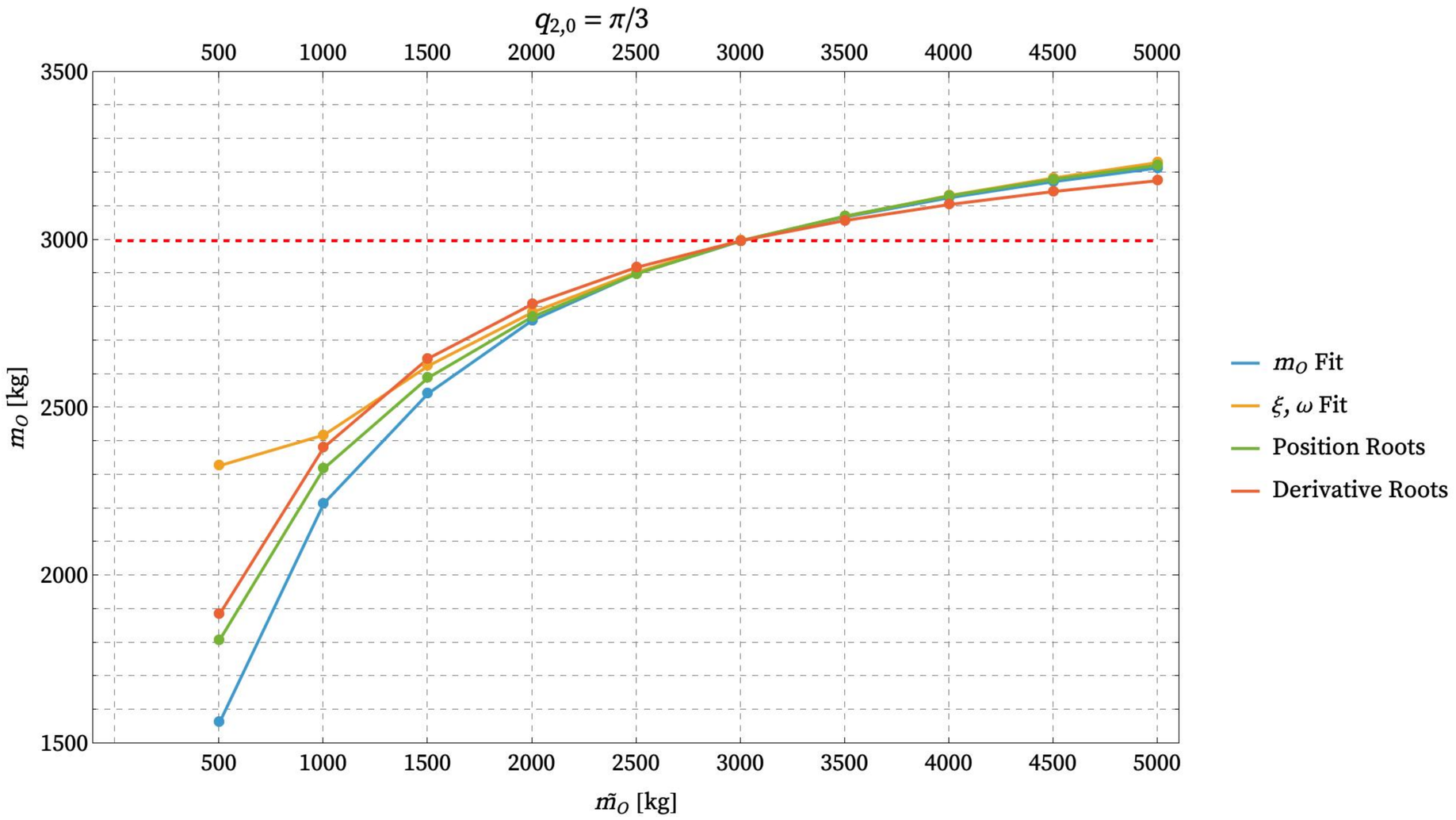
Mass extraction



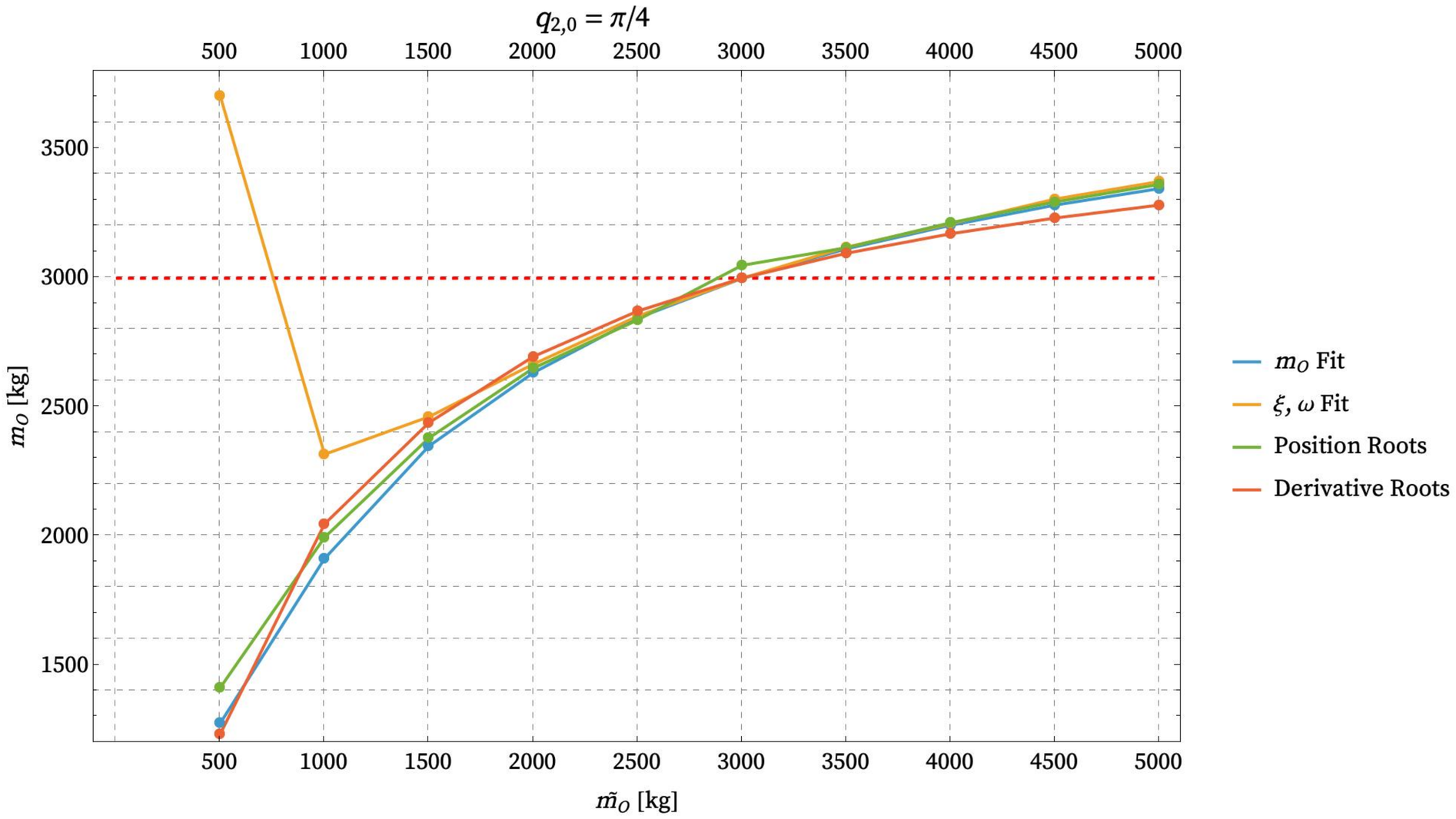
Mass extraction



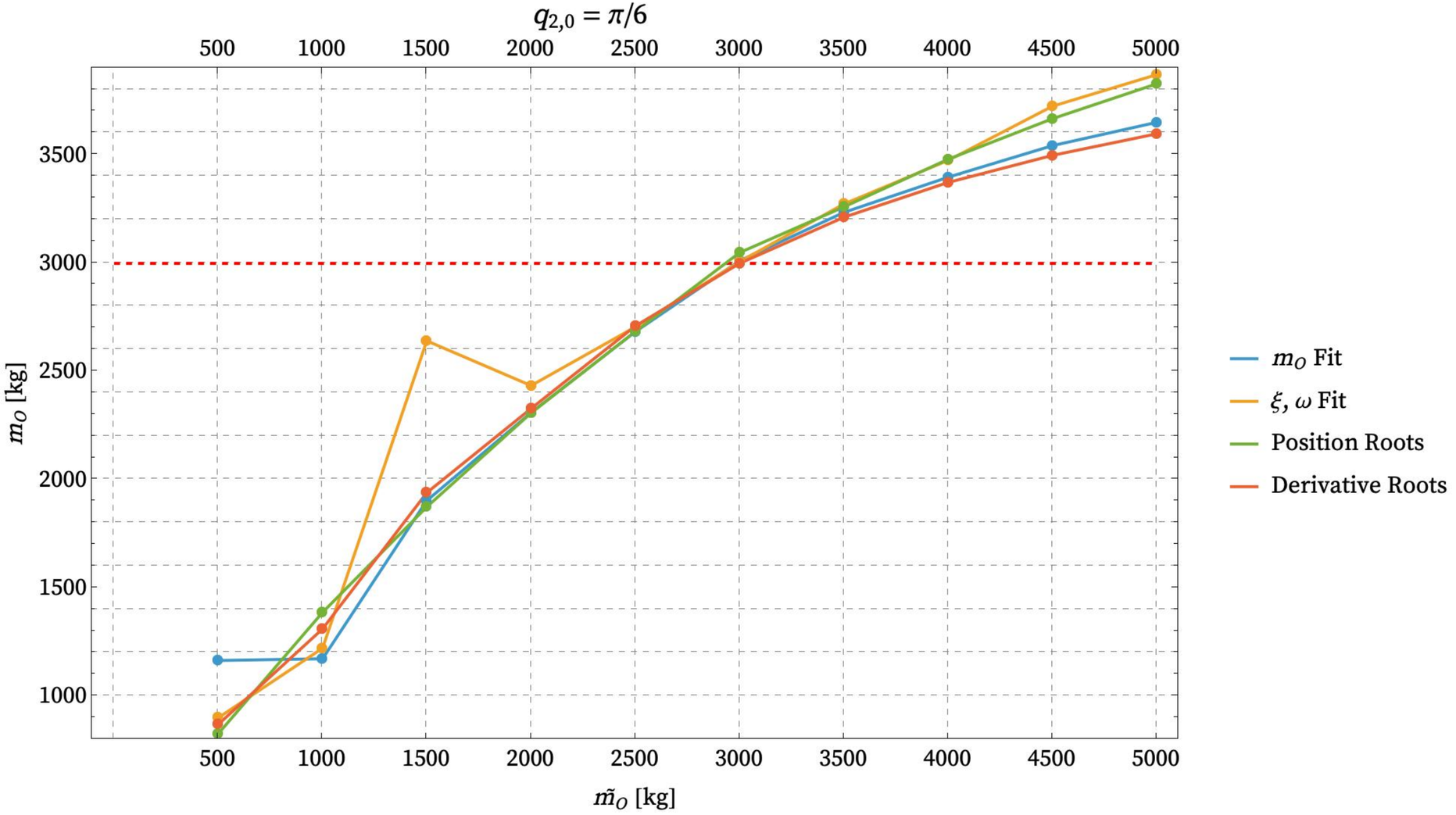
Mass extraction



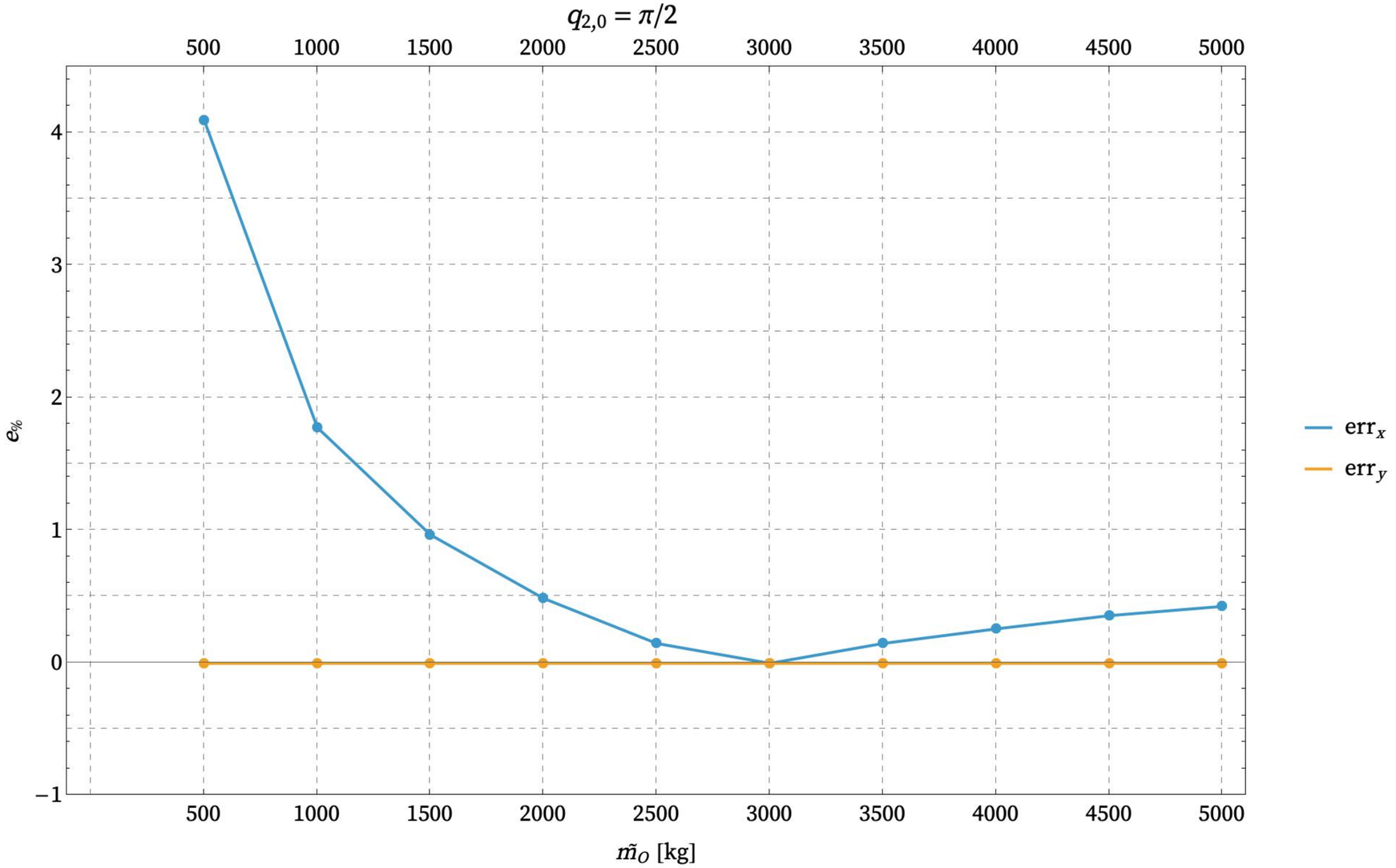
Mass extraction



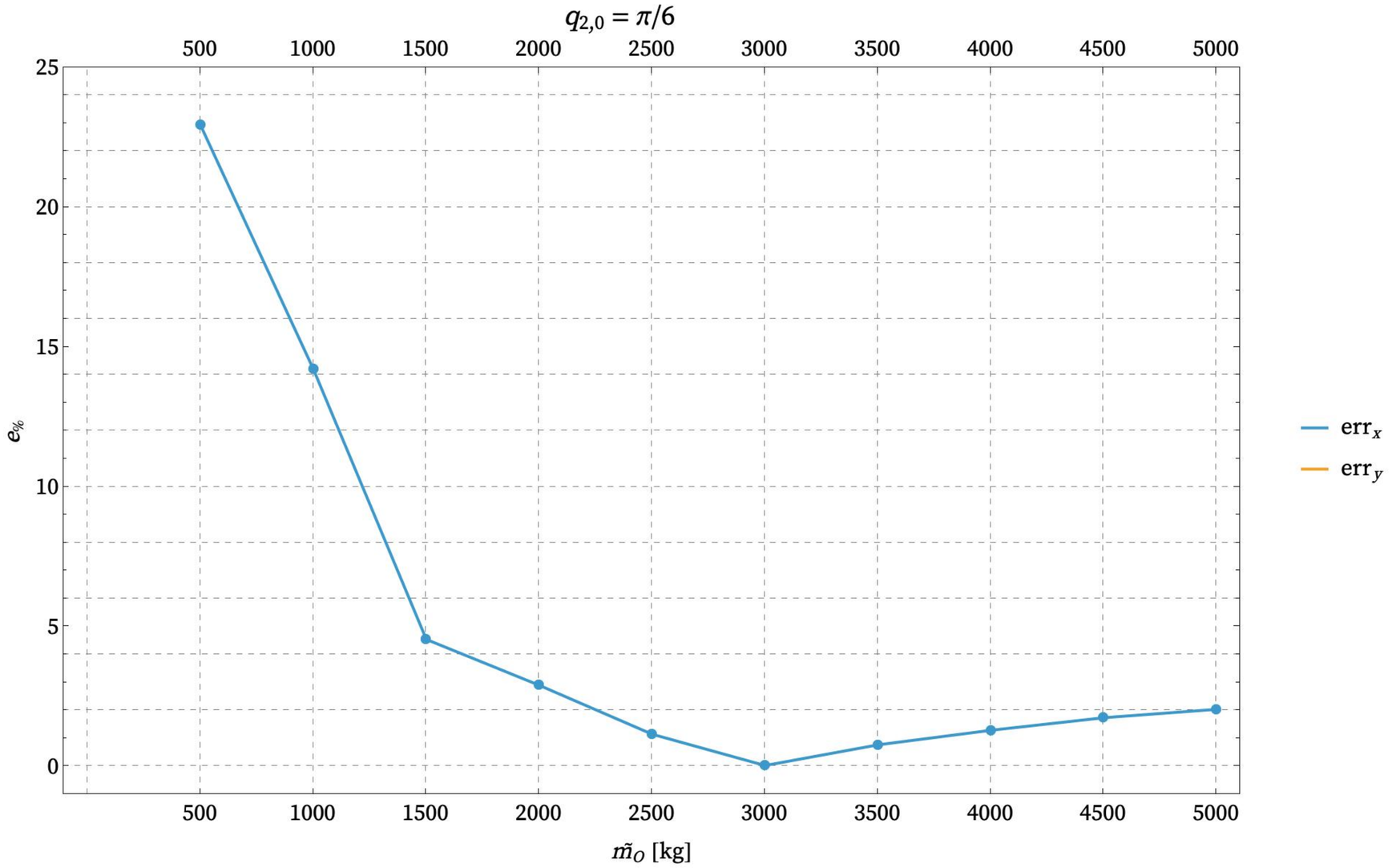
Mass extraction



Velocities


$q_{2,0} = \pi/2$
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
4
3
2
1
0
−1
$e_{\%}$
$\tilde{m_O}$ [kg]
err_x
err_y

Velocities


$q_{2,0} = \pi/6$
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
25
20
15
10
5
0
$e_{\%}$
$\tilde{m_O}$ [kg]
err_x
err_y

Velocities

- Relative error: $e_r = \left| \frac{x_{true} - x_{test}}{x_{true}} \right|$
- If $x_{true} = 0$:
  - $e = |x_{true} - x_{test}|$
  - $e_r = \left| \frac{x_{true} - \mu}{\mu} \right|$