Where are we going with post-Newtonian comparison

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Overview

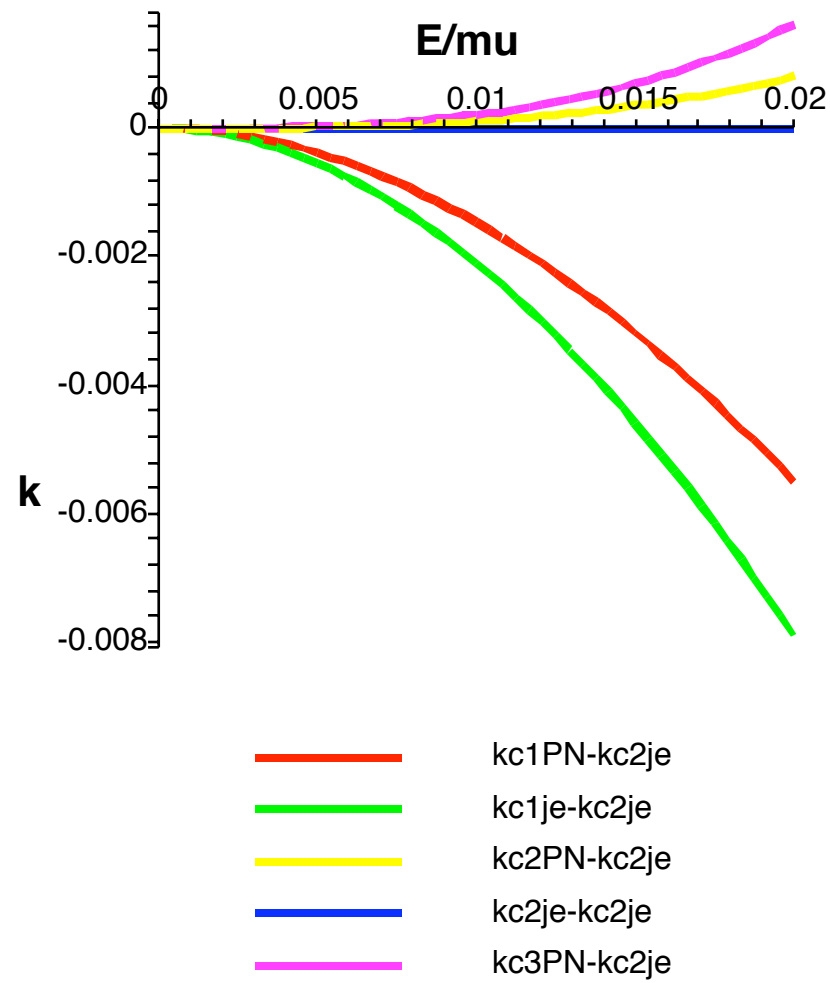
- Engineering the comparison
- Example using PN without caution!
- How smart do we have to become?
- Self-force vs PN: results and update
- Summary and outlook - call for haste

Engineering the PN comparison

- Need to find right variables, in right form
- Should fit to the noise for best results (not more or less, but essential nevertheless)
- Comparison using formal series expansion captures the best of both approaches
- We seem to be in better shape than NR
- Direct comparison with NR also possible!

Use PN with caution

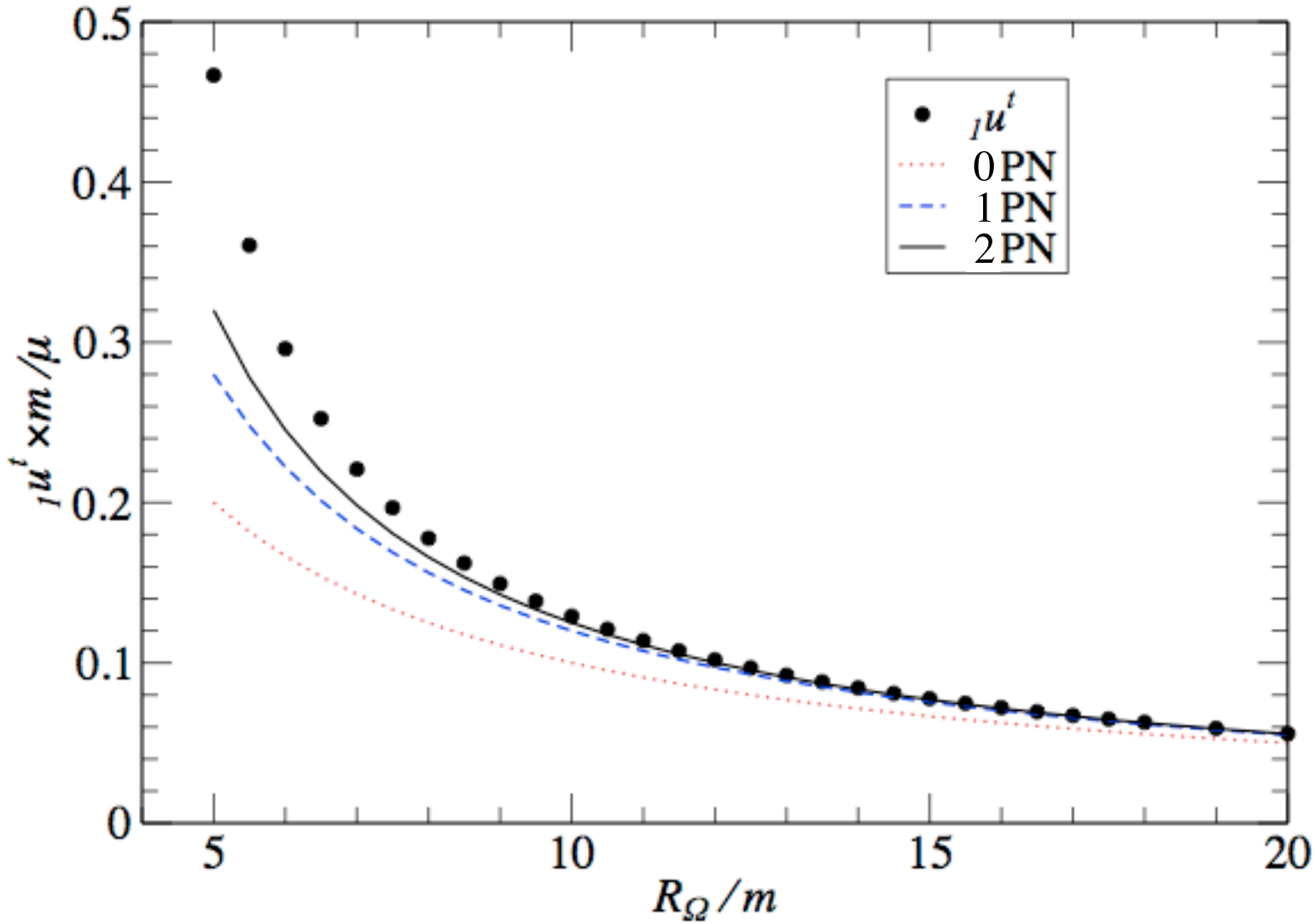
- Solve $er^2=0$ for j(E)
- Substitute in k(j,E)
- Subtract reference:
  - 1PN (strict) r
  - 2PN (strict) y
  - 3PN (strict) p
  - 1PN(exact) g
  - 2PN(exact) b



Being fair, or being smart?

- j(E) may not allow a good comparison
- Detweiler shows comparison is possible
- Need to understand whether Ω is good for comparison (other suggestions exist)
- Can Pade improvement be standardized?
- NR could be used to help clarify strategy

Self-force vs PN results (from Detweiler)



Self-force vs PN update (eg, Blanchet & Nagar)

- The 3PN comparison is possible
  - Requires same ingredients as used for equations of motion, known to 3.5PN
  - Code already exists, so just need to find it
- 4PN comparison for a_5 may also be possible
  - Use EOB as bootstrap for the comparison

Summary

- Post-Newtonian comparison now possible
- We should be able to help fix quantities which are required for NR comparison
- Self-force could play a role in waveform generation for ground based detectors
- We need to be expedient to pull this off