References on EMRI modelling (for the Sound of Space-time summer school at ICTP-SAIFR)

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Overview of EMRI modelling and self-force theory

- L. Barack and A. Pound, "Self-force and radiation reaction in general relativity", Reports on Progress in Physics, in press (2018), arXiv:1805.10385

(The Barack-Pound review covers all of the topics below at varying levels of detail and describes the current state of the field. It also lists multiple other more advanced reviews.)

Perturbation theory in GR

- Chapter 7.5 and Appendix C2 of Wald's textbook *General Relativity*

Gauge transformations

- M. Bruni, S. Matarrese, S. Mollerach, and S. Sonego, "Perturbations of spacetime: gauge transformations and gauge invariance at second order and beyond", Class. Quant. Grav. 14, 2585 (1997), arXiv:gr-qc/9609040
- A. Pound, "Gauge and motion in perturbation theory", Phys. Rev. D 92, 044021 (2015), arXiv:1506.02894

Geodesics in Schwarzschild and Kerr spacetimes

- Secs. 19-20 and 59-64 of Chandrasekhar's textbook *Mathematical Theory of Black Holes*
- W. Schmidt, "Celestial mechanics in Kerr spacetime", Class. Quant. Grav. 19, 2743 (2002), arXiv:gr-qc/0202090

Orbital evolution schemes

- Gralla-Wald, self-consistent, and osculating-geodesic approximations
  - Secs. 1.4, 1.5, and 5 of A. Pound, "Motion of small objects in curved spacetimes: An introduction to gravitational self-force", in *Equations of Motion in Relativistic Gravity*, edited by D. Puetzfeld et al., Fundamental Theories of Physics 179, Springer, 2015, arXiv:1506.06245
- two-timescale approximation
  - T. Hinderer and E. E. Flanagan, "Two timescale analysis of extreme mass ratio inspirals in Kerr. I. Orbital Motion", Phys. Rev. D 78, 064028 (2008), arXiv:0805.3337

Adiabatic approximation

- S. Drasco, E. E. Flanagan, and S. A. Hughes, "Computing inspirals in Kerr in the adiabatic regime. I. The scalar case", Class. Quant. Grav. 22, S801-846 (2005), arXiv:gr-qc/0505075
- K. Ganz, W. Hikida, H. Nakano, N. Sago, T. Tanaka, "Adiabatic Evolution of three 'Constants' of Motion for Greatly Inclined Orbits in Kerr spacetime", Prog. Theor. Phys. 117, 1041-1066 (2007)

Resonances

- E. E. Flanagan and T. Hinderer, "Transient resonances in the inspirals of point particles into black holes", Phys. Rev. Lett. 109, 071102 (2010), arXiv:1009.4923

Matched asymptotic expansions

- A. Pound, "Motion of small objects in curved spacetimes: An introduction to gravitational self-force", in *Equations of Motion in Relativistic Gravity*, edited by D. Puetzfeld et al., Fundamental Theories of Physics 179, Springer, 2015, arXiv:1506.06245
- A. Pound, "Nonlinear gravitational self-force: second-order equation of motion", Phys. Rev. D 95, 104056 (2017), arXiv:1703.02836

Puncture schemes, mode-sum "regularization", and other practical calculation methods

- Sec. 4 of A. Pound, "Motion of small objects in curved spacetimes: an introduction to gravitational self-force", in *Equations of Motion in Relativistic Gravity*, edited by D. Puetzfeld et al., Fundamental Theories of Physics 179, Springer, 2015, arXiv:1506.06245

- Secs. 3 and 4 of L. Barack, “Gravitational self force in extreme mass-ratio inspirals”, Class. Quant. Grav. 26, 213001 (2009), arXiv:0908.1664
- B. Wardell, “Self-force: computational strategies”, in *Equations of Motion in Relativistic Gravity*, edited by D. Puetzfeld et al., Fundamental Theories of Physics 179, Springer, 2015, arXiv:1501.07322.