

The propagation delay in the timing of a pulsar orbiting a supermassive black hole

Pulsar timing offers the possibility to test the theory of gravity in the strong field regime. Particularly promising laboratories for such tests are pulsar – black hole binaries. In such a system it is therefore of utmost importance to accurately model the effects of General Relativity. We present an analytical calculation for the relativistic propagation delay of the signal of a pulsar orbiting a supermassive black hole in the test particle approximation. We compare our results to the usually employed post – Newtonian approximation methods, including the case of edge-on orbits.