

While current gravitational wave observations with ground based detectors have been consistent with compact binaries in quasi-circular orbits, eccentric binaries may be detectable by ground- and space-based instruments in the near future. Eccentricity significantly complicates the gravitational wave signal, and we currently lack fast and accurate models that are valid in the moderate to large eccentricity range. In this talk, I will present a frequency-domain model valid to 3rd post-Newtonian order for non-spinning binary inspirals that is accurate up to rather high initial eccentricities. The model combines the stationary phase approximation, a truncated sum of harmonics of combinations of two orbital frequencies (an azimuthal one and a radial one), and a bivariate expansion in the orbital separation and the eccentricity, yielding matches between 97% and 99% relative to a fully-numerical, time domain post-Newtonian model.