Assessing Accuracy of Waveform Models against Numerical Relativity Waveforms MICHAEL PÜRRER, Max Planck Institute for Gravitational Physics (AEI) Golm, LVC COLLABORATION — We compare currently available phenomenological and effective-one-body inspiral-merger-ringdown models for gravitational waves (GW) emitted from coalescing black hole binaries against a set of numerical relativity waveforms from the SXS collaboration. Simplifications are used in the construction of some waveform models, such as restriction to spins aligned with the orbital angular momentum, no inclusion of higher harmonics in the GW radiation, no modeling of eccentricity and the use of effective parameters to describe spin precession. In contrast, NR waveforms provide us with a high fidelity representation of the "true" waveform modulo small numerical errors. To focus on systematics we inject NR waveforms into zero noise for early advanced LIGO detector sensitivity at a moderately optimistic signal-to-noise ratio. We discuss where in the parameter space the above modeling assumptions lead to noticeable biases in recovered parameters.

Michael Pürrer
Max Planck Institute for Gravitational Physics (AEI) Golm