Measuring the initial-final mass relation using wide binaries

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The white dwarf Initial-Final Mass-Relation (IFMR) is an important ingredient in understanding stellar evolution from start to finish, but cannot easily modelled. However, the IFMR can be empirically determined in a number of ways, with white dwarfs in open clusters historically the most common approach. More recently, binaries containing white dwarfs have also been used to constrain the IFMR, under the assumption that both components have the same total age. We have observed 58 wide double white dwarf (DWDs) binaries with FORS2, sampling a wide range of $T_{\rm eff}$ and $\log g$. With precisely measured stellar parameters for both components, we expand upon the Bayesian framework introduced by Andrews et. al. (2015) to determine a multi-segment IFMR covering initial masses of 1–8 $M_{\odot}$. To our surprise, 46 percent of our observed DA-DA pairs have irreconcilable stellar parameters and thus cannot have evolved together without having undergone other interactions, such as mergers.