1 Description

- (Working) Title: The effects of binary stars on recovered remnant populations.
- Hypothesis/Research Question: So I think the goal is basically to see what the effects of realistic binary populations are on LIMEPY models and by extension, see what the effects on the recovered remant population are.
- Goals and Objectives: Create realistic binary populations, make some toy models to demonstrate the effects, fit models with realistic binary populations to observations, compare remant populations.

2 Motivation and Rationale

Right now, our models don't account for binaries at all, some studies suggest that binaries could mimic the effect of heavy remants (Do we need citations in the summary?). By including realistic binary populations, we hope to get better estimates for the heavy remants. Discuss the (few) observations that we have and the limits of the observations, as well as things that just aren't well constrained at all like the distribution of mass ratios in GCs.

3 Methodology

- Approach to problem
- Techniques/Methods

Basically we're just going the shift the mass around according to the binary fractions and chosen mass ratio distribution. the models will then be fit in the usual way with GCfit but will need to take special care with mass function fitting. Check how much detail we want here, probably want to, at the minimum, justify why we can just shift mass around and basically treat binaires as single stars.

4 Timelime

- Basic reading and planning ✓
- Get the realistic binary populations working
  - Currently have it working with binaries defined by mass fraction ✓

  - Use the correct binary fraction so that we can compare to observations (1-3 weeks? less straightforward than I hoped)

- Project Summary (Nov 1st)
- Toy models (1-2 weeks)
- Use mass-luminosity relations to get the apparent mass of the binary system in order to fit on MF data (1-2 weeks)
- Modify the GCfit code to allow for the mass function to be fit to the observed mass of the binary system (I'm thinking this might be the longest part, maybe a few weeks?)
- Fit models (1-2 weeks, should easy once we modify GCfit)
- Literature Review (Ongoing - Jan 31st)
- Progress Report (Feb 7th)
- Thesis Draft (Ongoing - March 18th)
- End date (April 4th)