

## README

In the folder `data` you can find Galactocentric offset, `F_light` and enclosed flux values for the magnetar, pulsar, young pulsar, HMXB and LMXB samples, as described in Chrimes et al. (2021). In each .txt, the columns are:

- 0 - Galactocentric offset [kpc]
- 1 - Host-normalised offset (B-band)
- 2 - Host-normalised offset (I-band)
- 3 - `F_light` (B-band)
- 4 - `F_light` (I-band)
- 5 - Enclosed flux (B-band)
- 6 - Enclosed flux (I-band)

#####

Everything else in this repo is adapted from the Milky Way fraction of light code used in Chrimes et al. (2021).

!!! This is WIP and is still being updated as of July 2021 !!!

Simply clone/download this repo and run either the ipython notebook or the .py script. These both produce an interactive figure showing the fraction of light distribution for Milky Way magnetars, given the best estimate of their heliocentric distance. The default scaling of the bulge, disc and arm components produces a B-band image.

With this notebook/script, you can vary:

1. The factor by which the bulge luminosity is decreased from the I-band image to get the B-band version (default is 5.6)
2. The factor by which the spiral arm (maser) luminosity is decreased from the I-band image to get the B-band version (default is 2)
3. The factor by which the disc luminosity is decreased from the I-band image to get the B-band version (default is 2.7)
4. The pixel selection radius. Varying this approximates varying the background level of an image and/or the surface brightness of the galaxy, as if the pixels were being selected with e.g. source extractor.
5. The spatial resolution, in kpc/pixel. The default is 0.25, similar to HST resolution at  $z \sim 1$ . The images are not recalculated on the fly, and instead rely on pre-calculated data at each resolution. As a result, the slider moves continuously, but the resolutions won't!

Note that any (1), (2) and (3) values which preserve the default ratios produce a B-band image. To get an I-band version, simply set all three reduction factors to the same (can be any) value. Initially and upon each new choice of parameters, a txt file called 'flight.txt' will be saved containing the magnetar `F_light` values.

#####

Updates coming soon:

- ability to choose different NS populations, e.g. XRBs and pulsars