

A PanSTARRS view on Monoceros

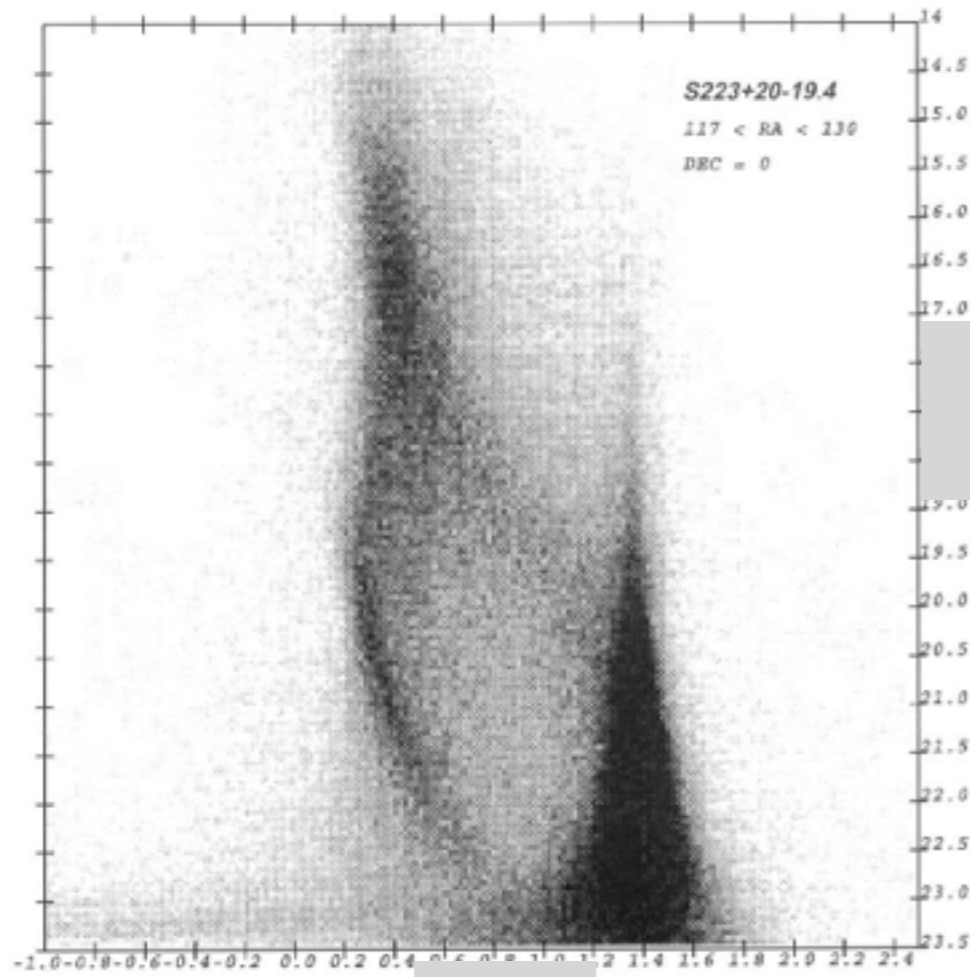
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Hans-Walter Rix (MPIA)
KP5 PanSTARRS group

Overview

- Quick overview on Monoceros
- PanSTARRS coverage
- PanSTARRS analysis - Colour-Magnitude Diagram fitting
- Structures in the Disk
- Monoceros as a ... stream, flare, ripple?

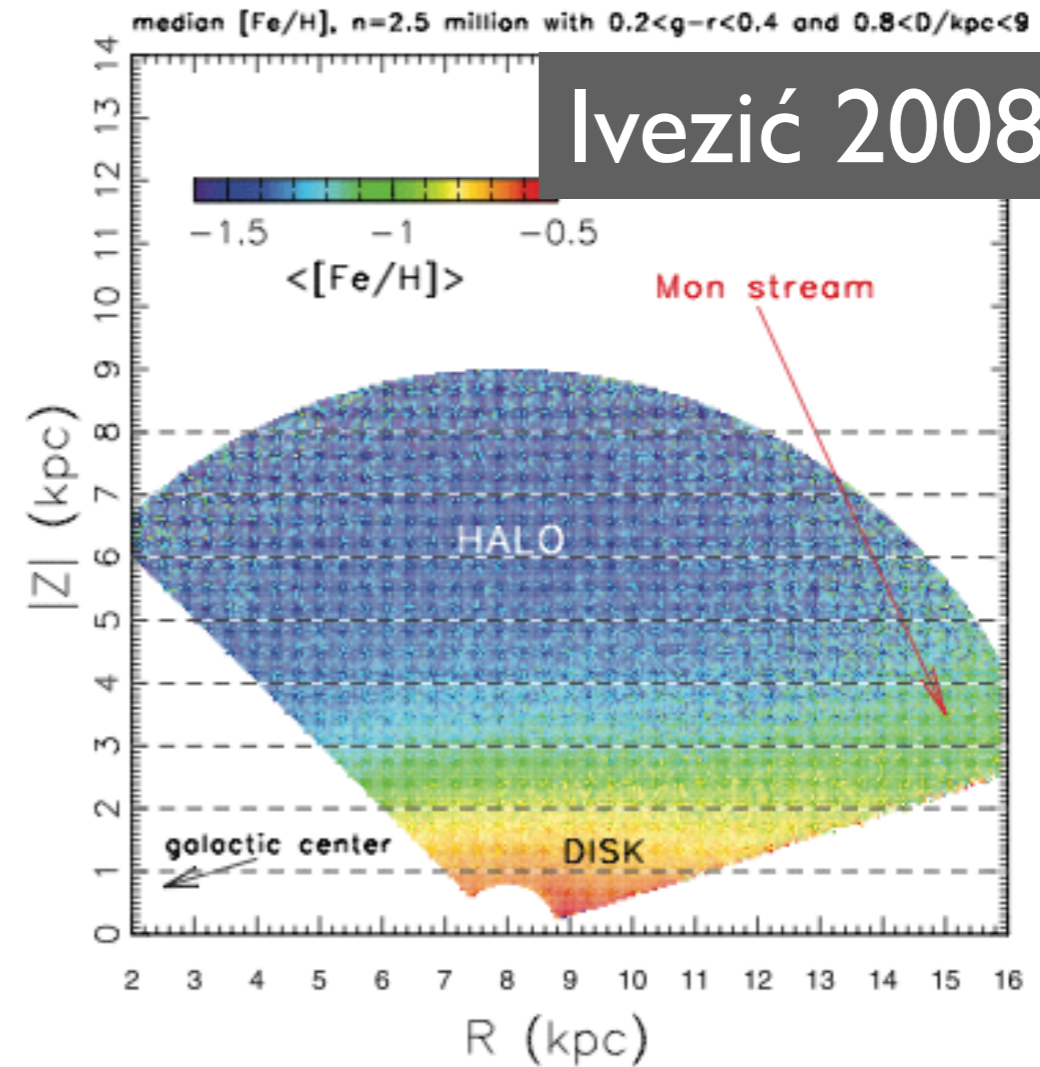
Monoceros Overview

GHOSTS AND LUMPS IN THE MILKY WAY



g-r

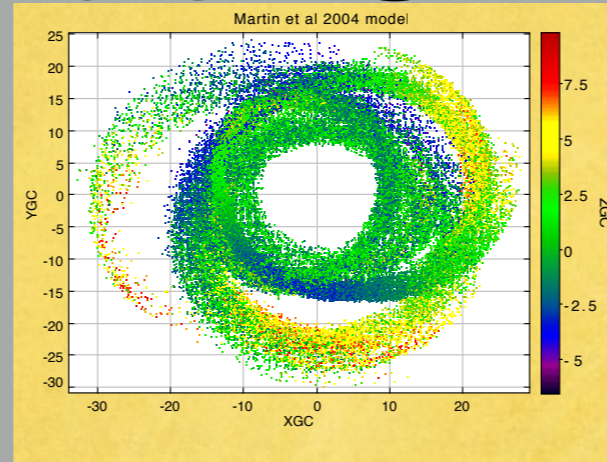
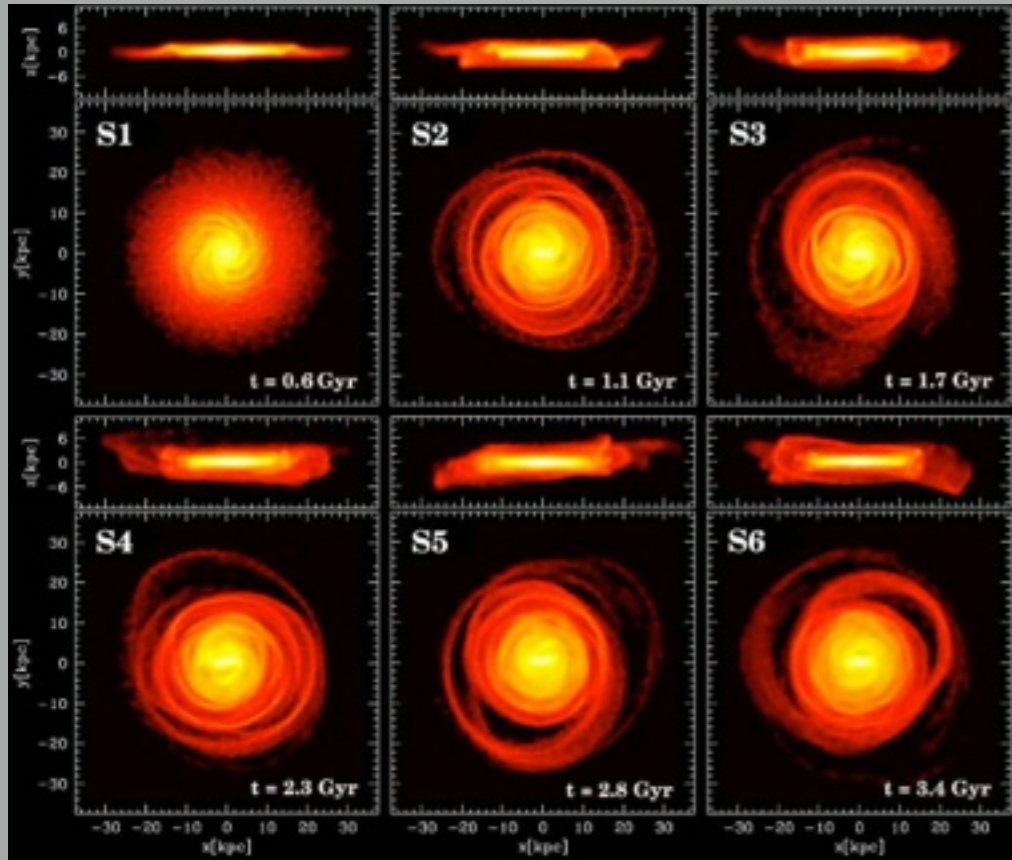
Newberg 2002



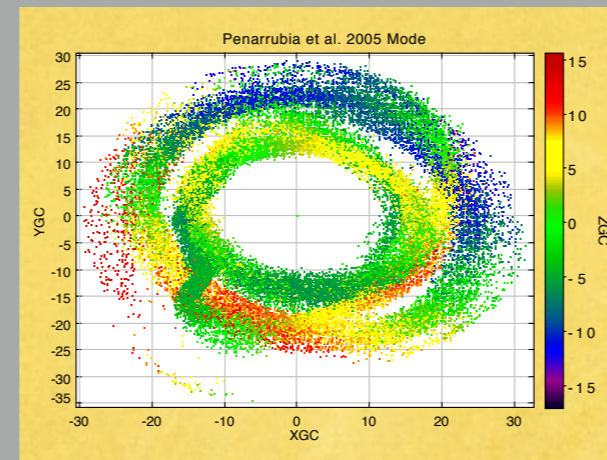
Ivezić 2008

Monoceros Overview

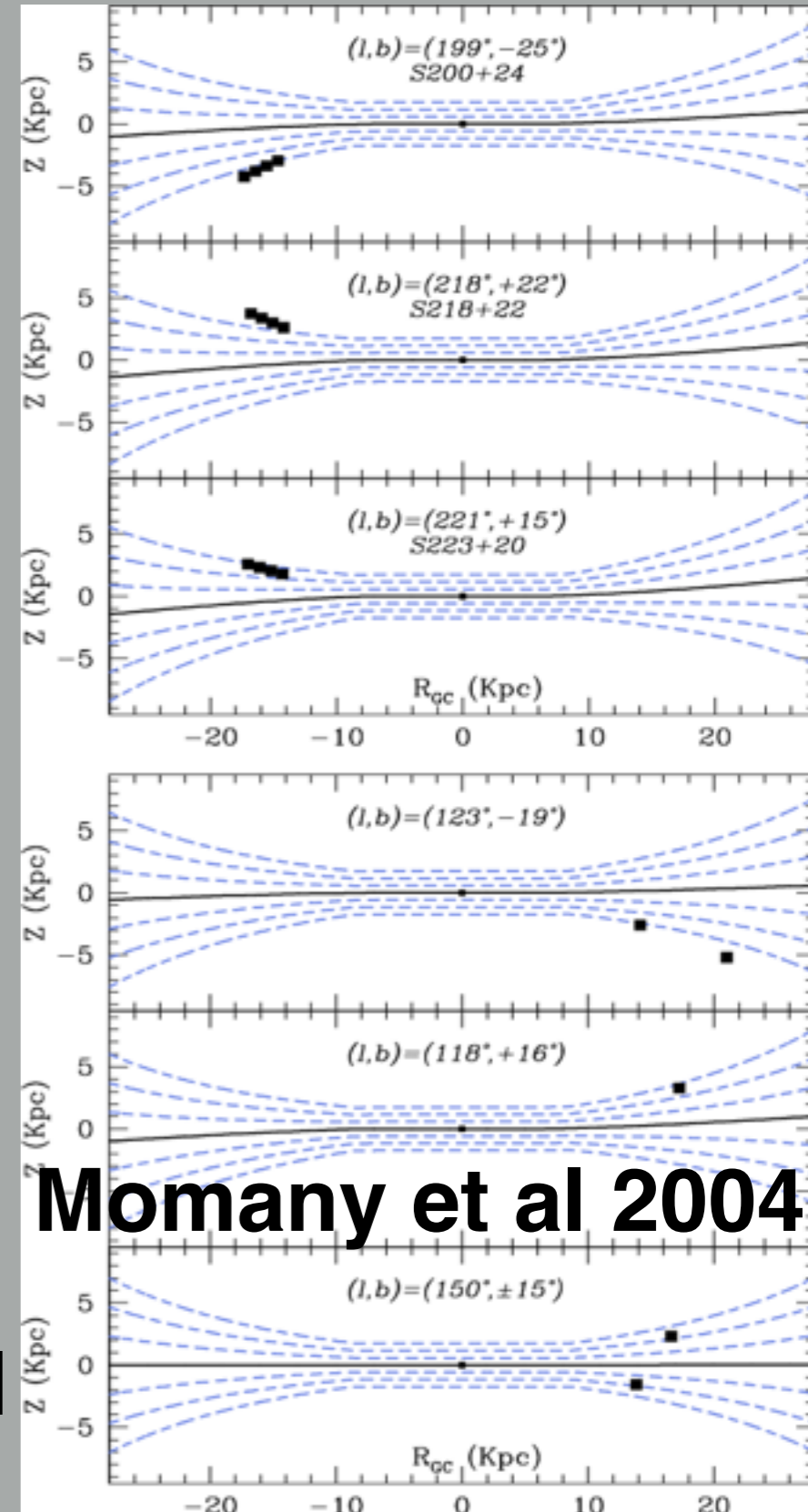
Kazantzidis et al 2009



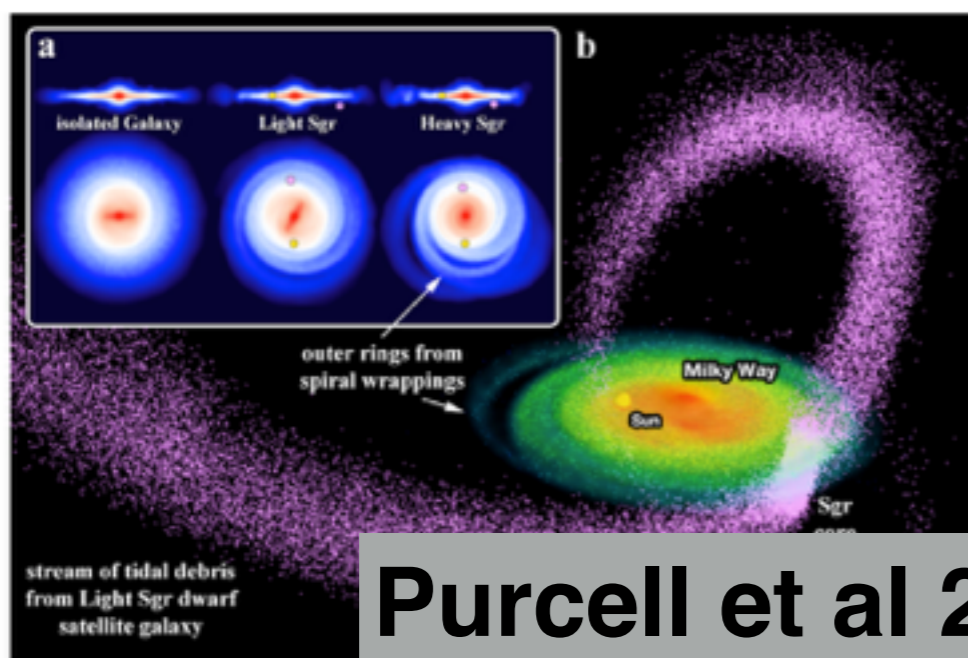
Martin et al 2004



Peñarrubia et al. 2005



Momany et al 2004



Ripple Model

Purcell et al 2011 Xu et al 2015

Monoceros Overview

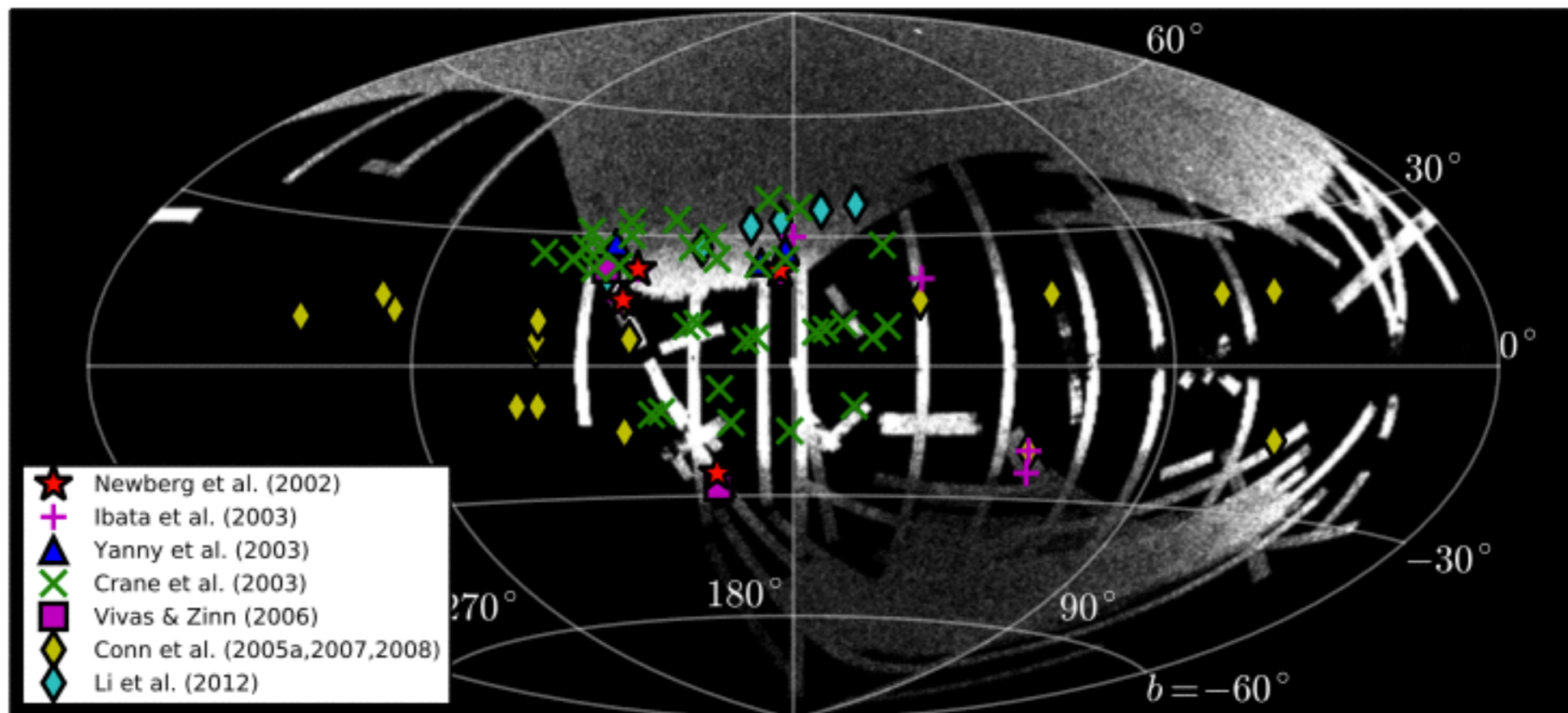
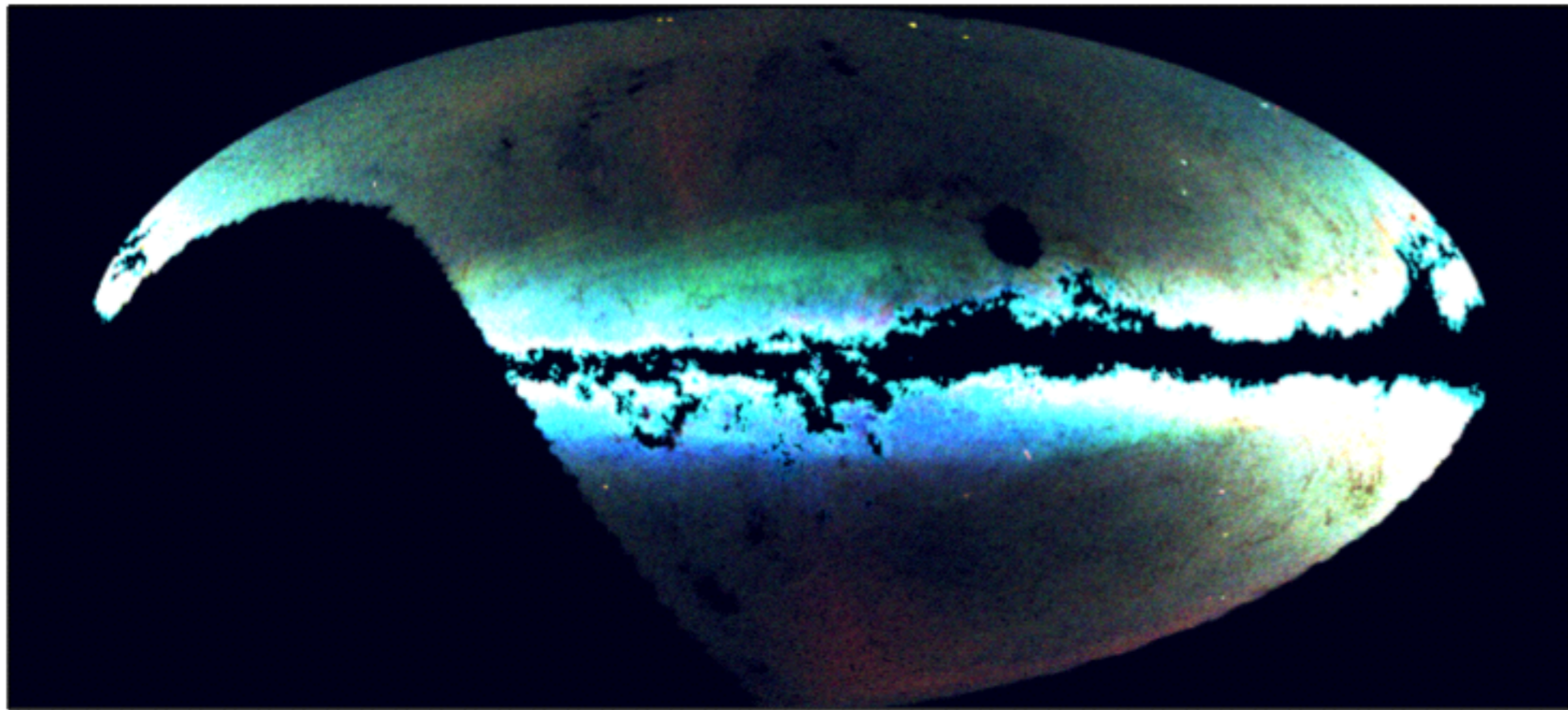


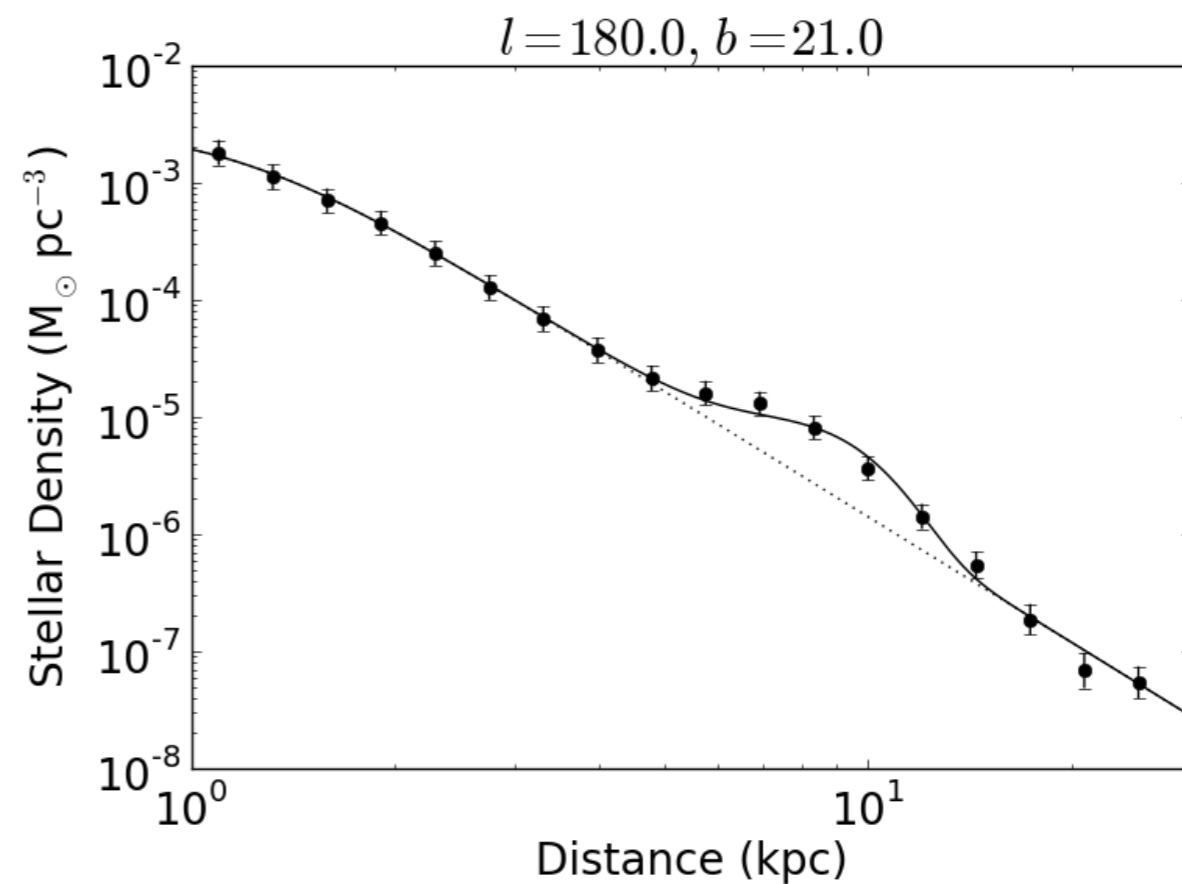
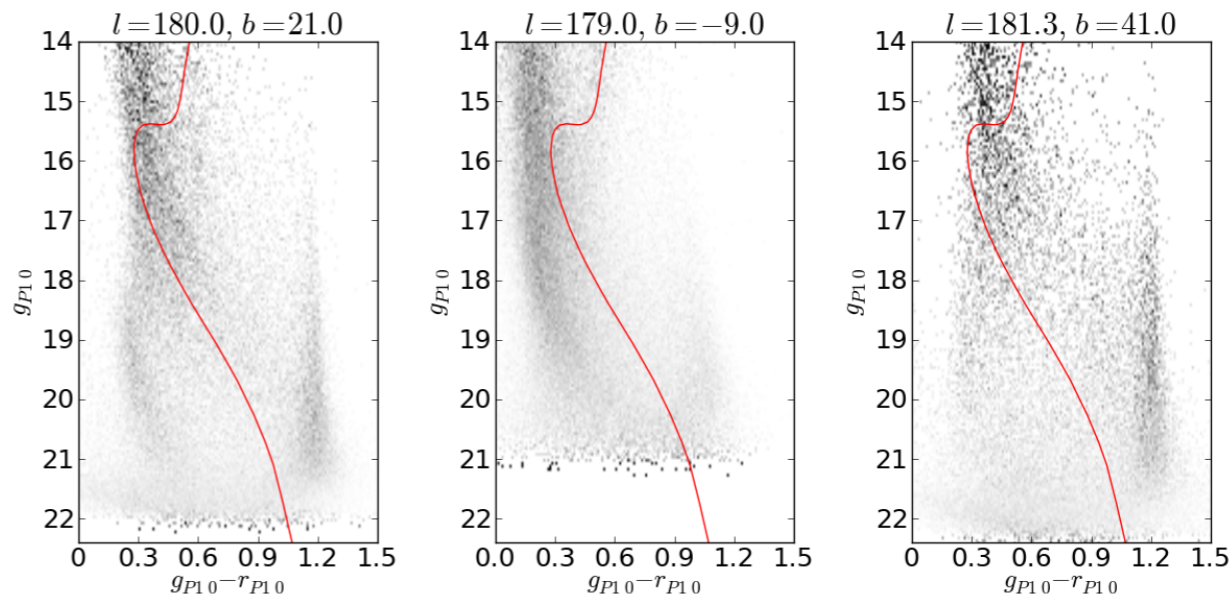
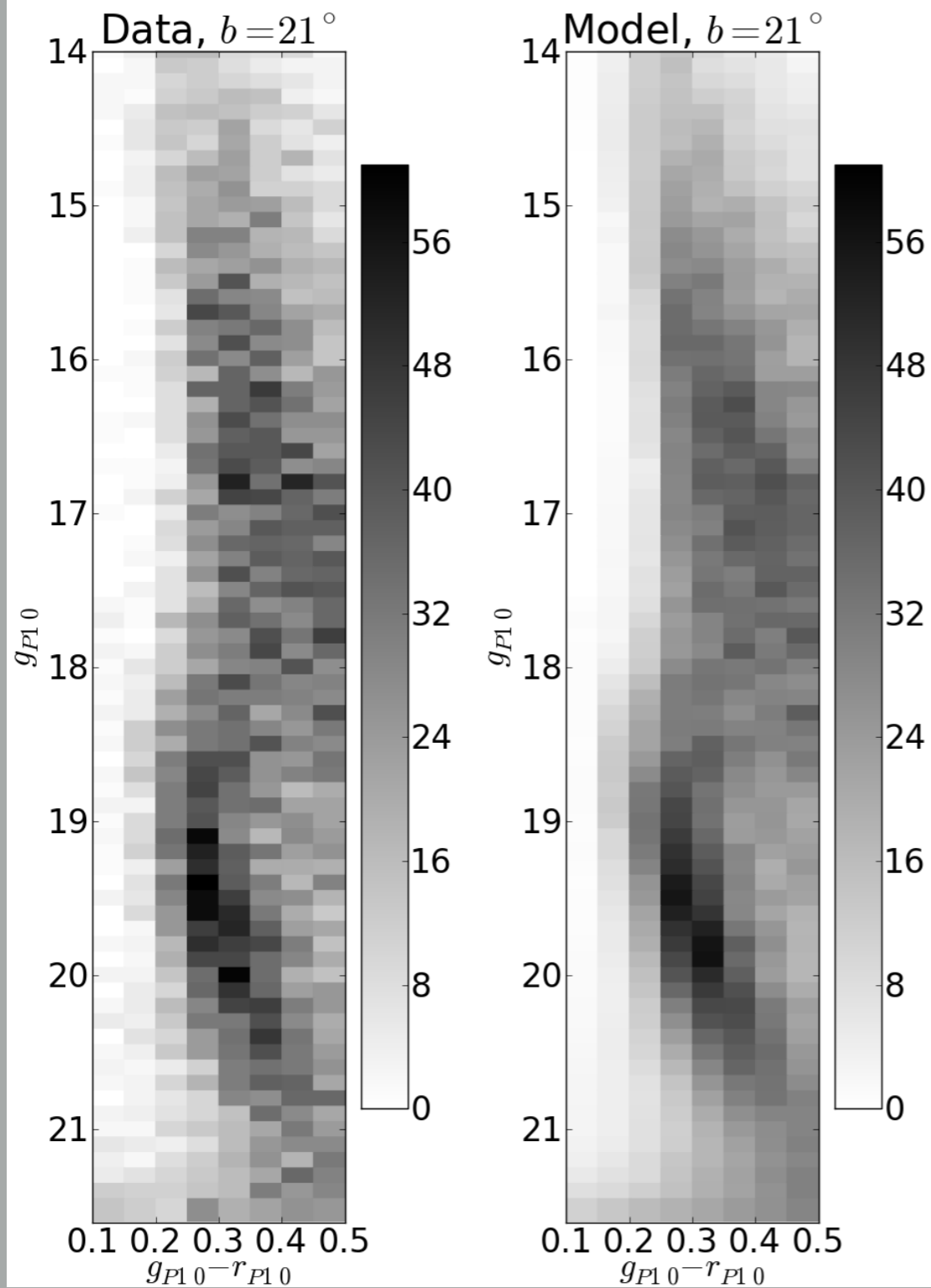
Figure 1. A comparison of previous detections of the MRi from various authors (each listed in the figure legend), overlaid on the map of the MRi as seen by the SDSS (showing the density of stars with $0.2 < (g-r)_0 < 0.4$ and $18.6 < g_0 < 19.8$). While the individual pointings clearly show that the MRi occupies a significant amount of area in the Galactic anticenter, both north and south of the Galactic plane, it is difficult to understand the morphology of the structure without contiguous imaging coverage.

PanSTARRS Coverage



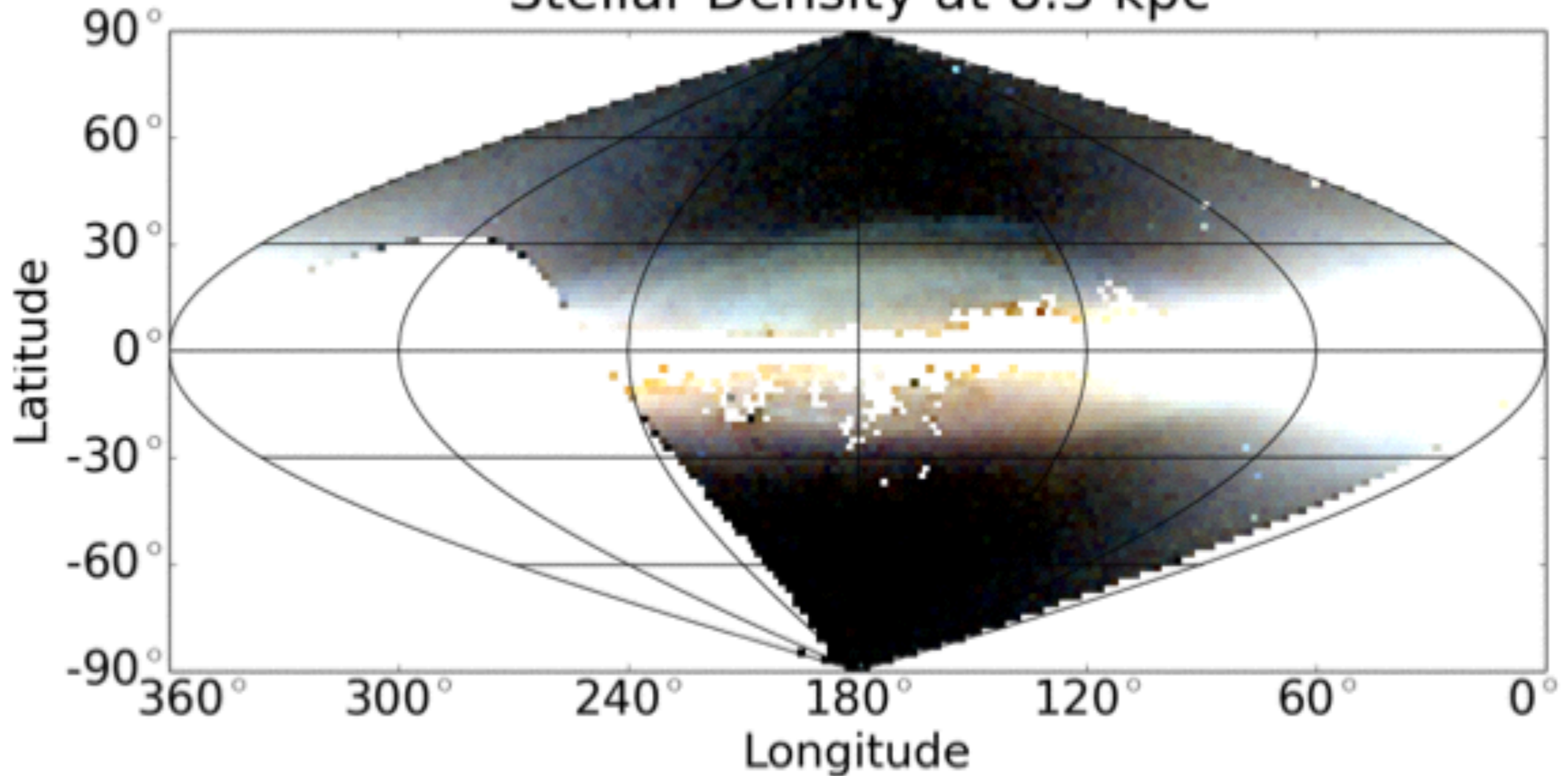
Slater et al 2014

PanSTARRS Analysis

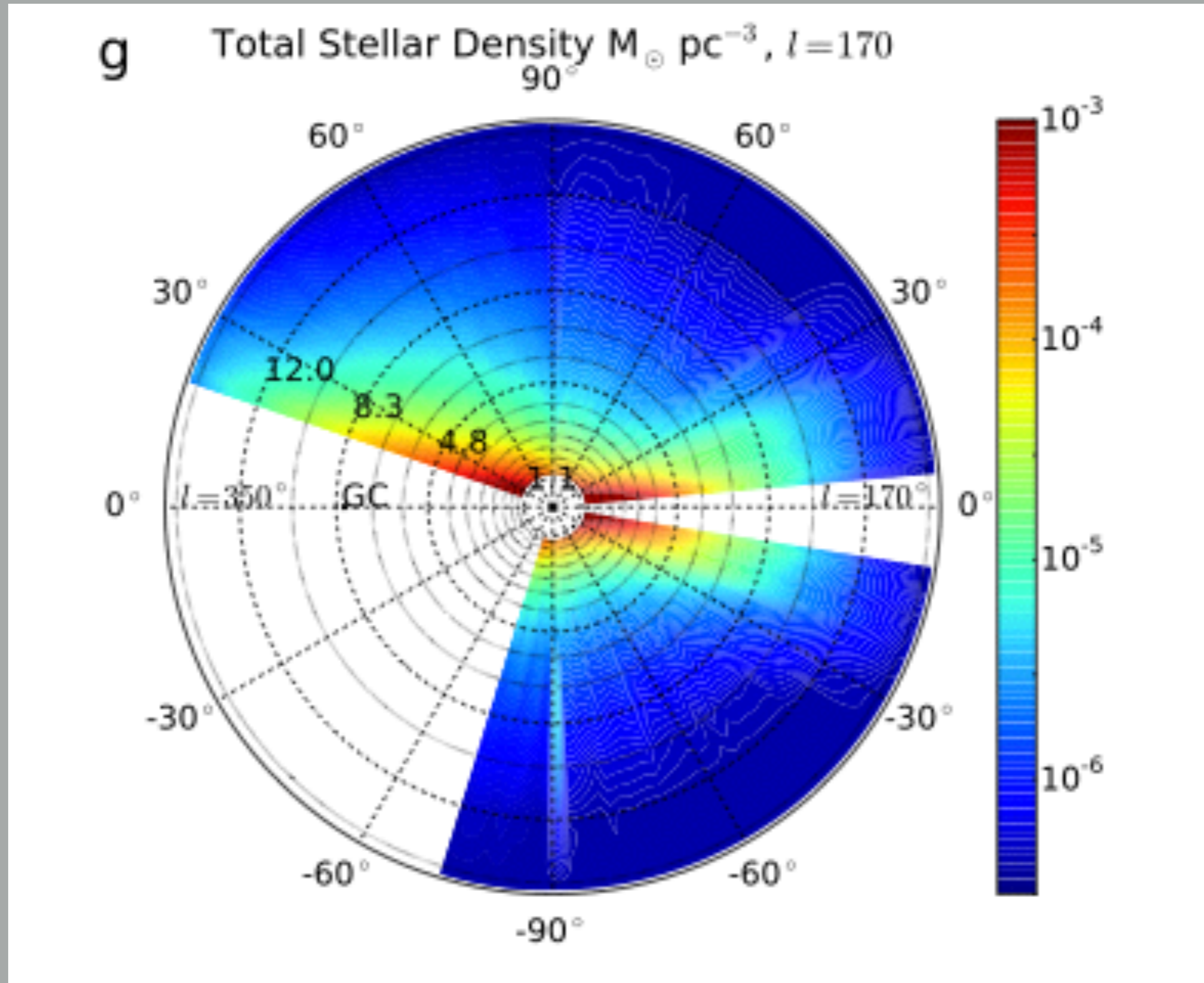


PanSTARRS Analysis

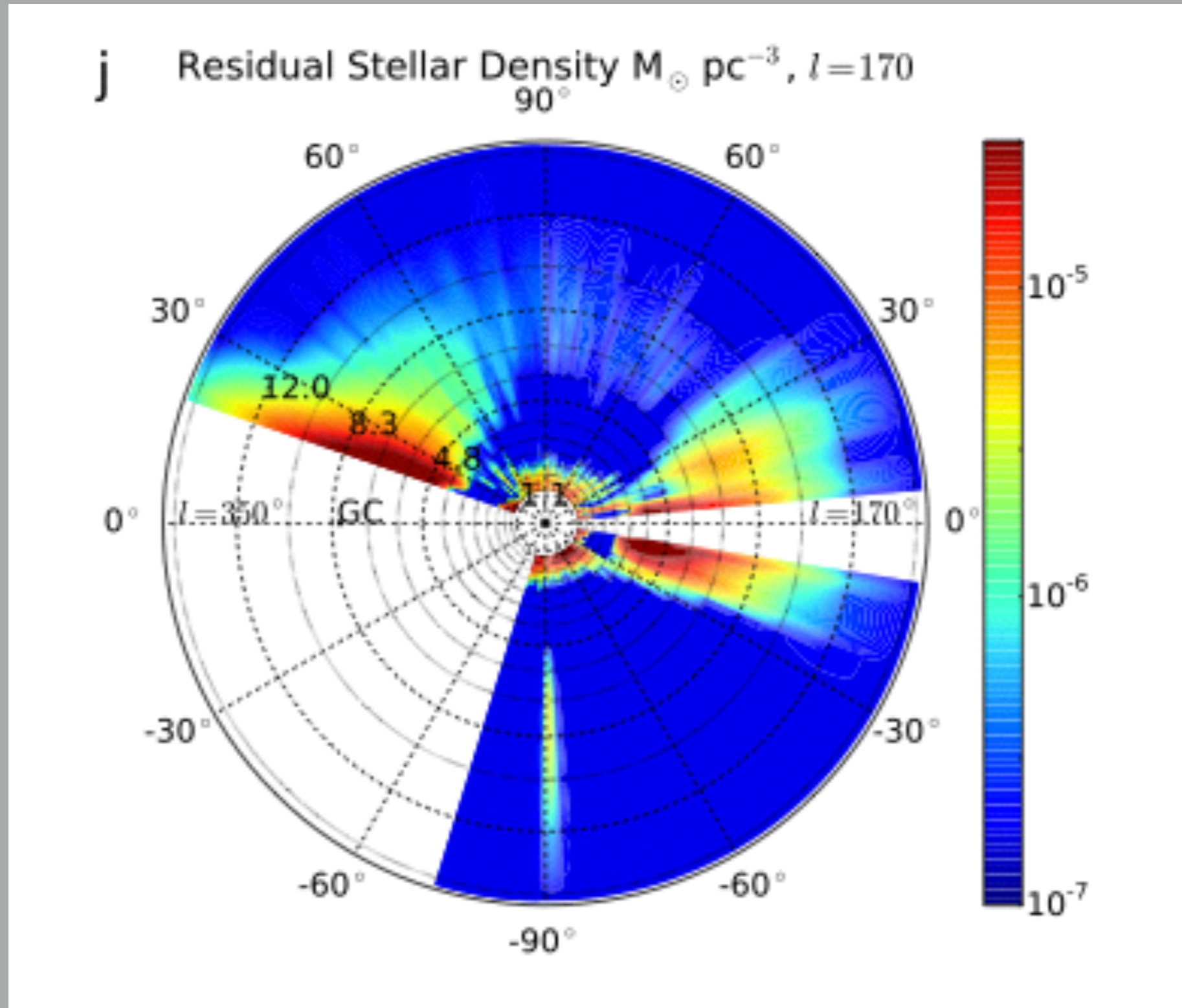
Stellar Density at 8.3 kpc

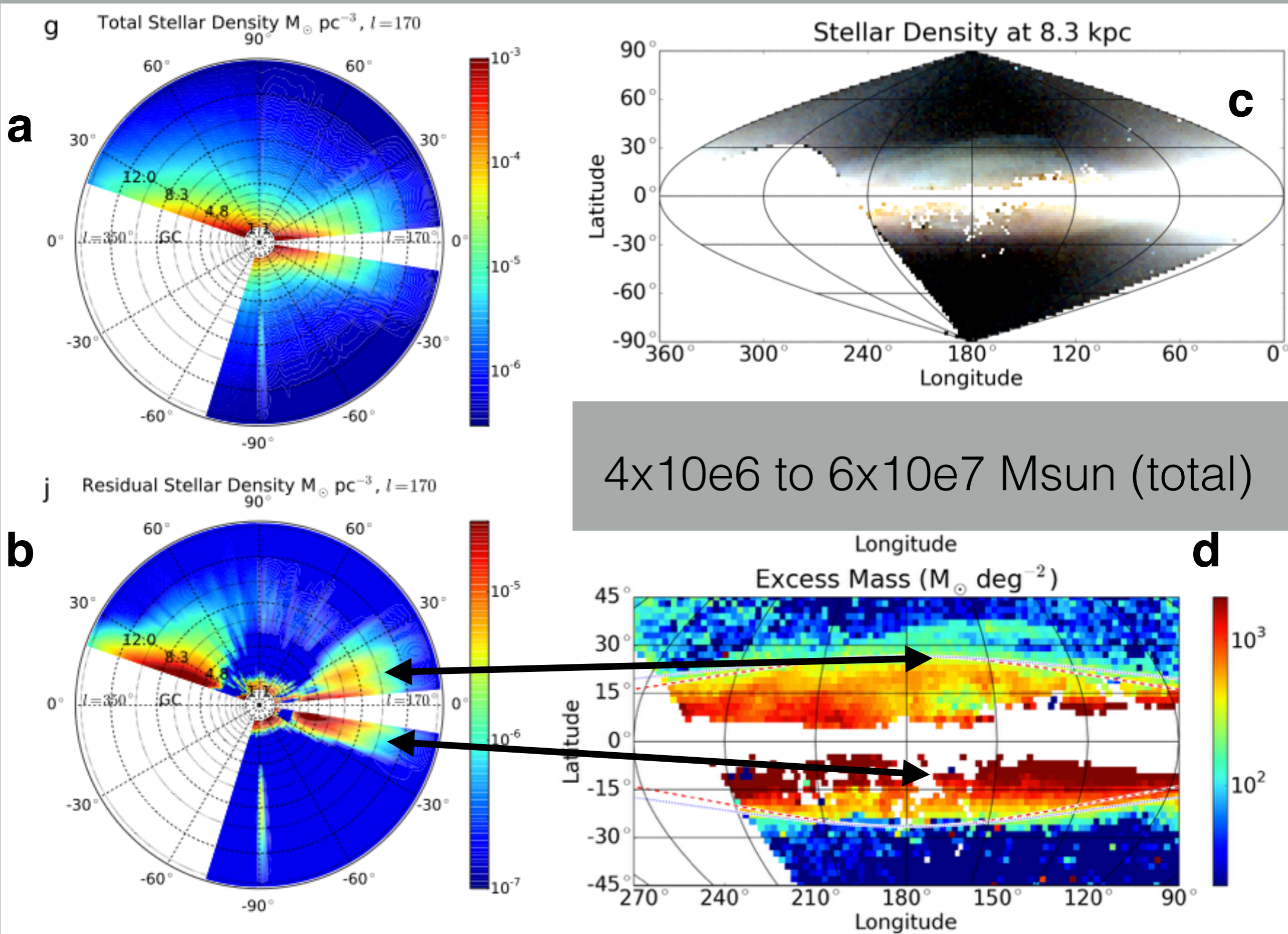


Structures in the disk

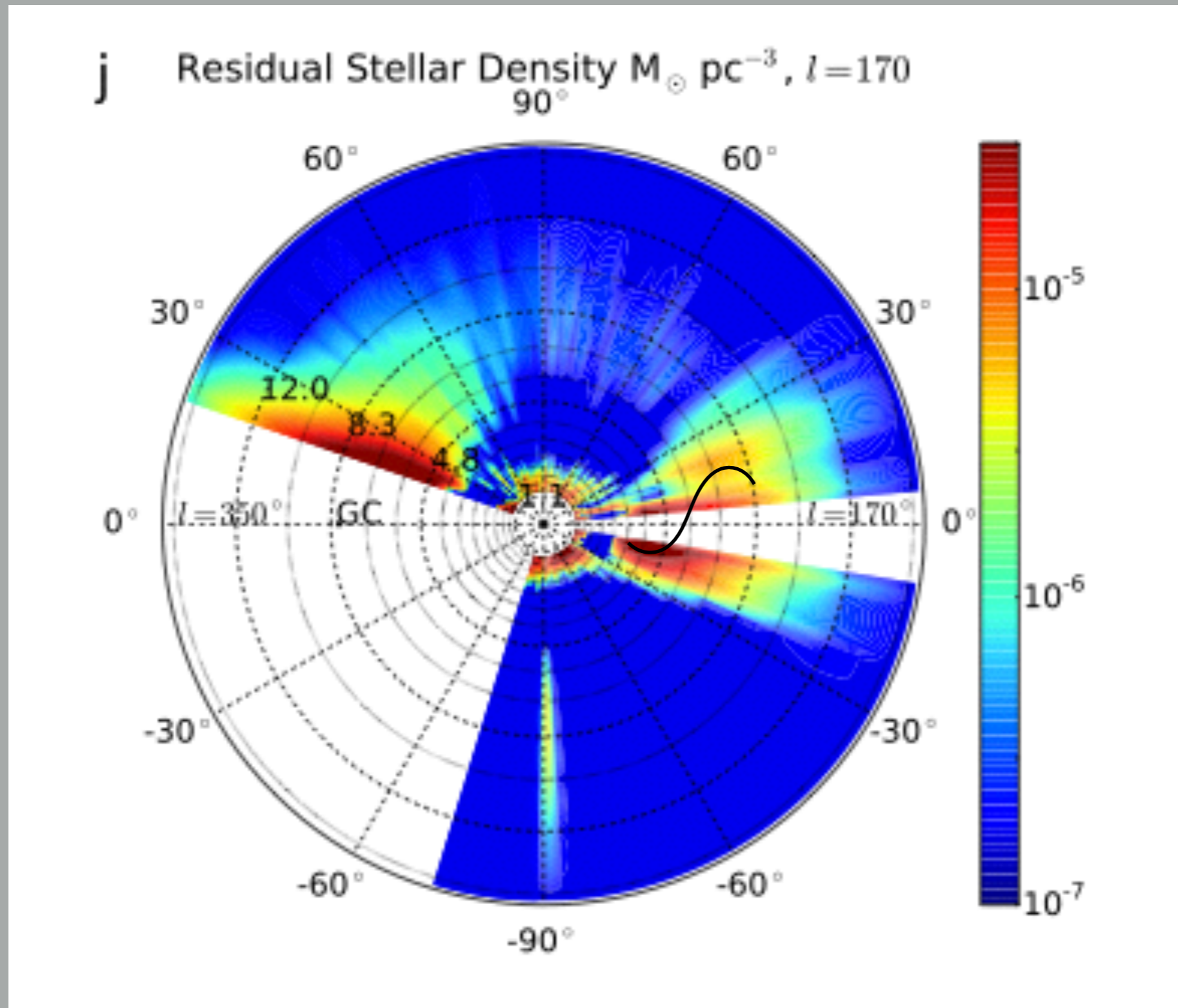


Structures in the disk

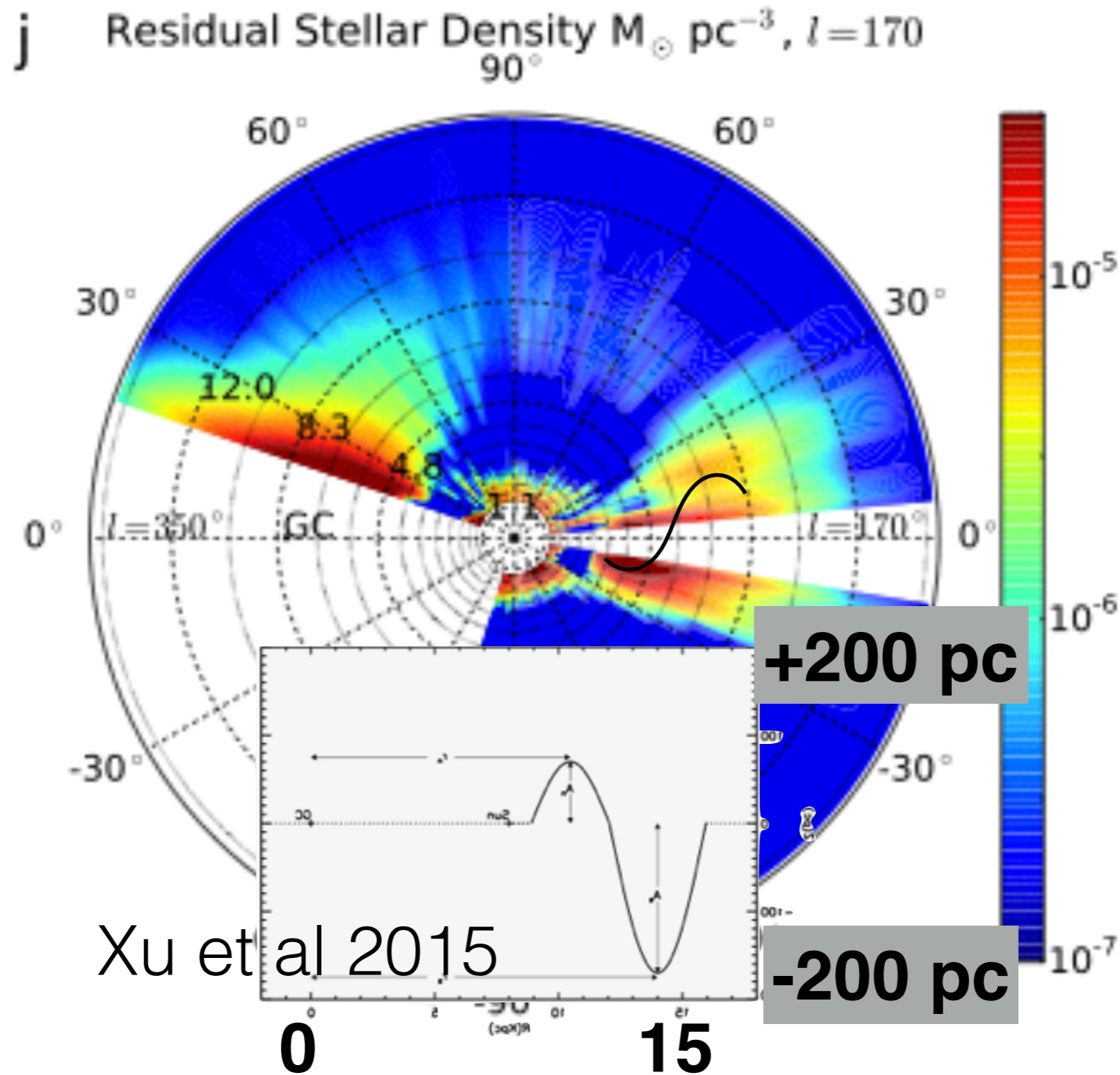




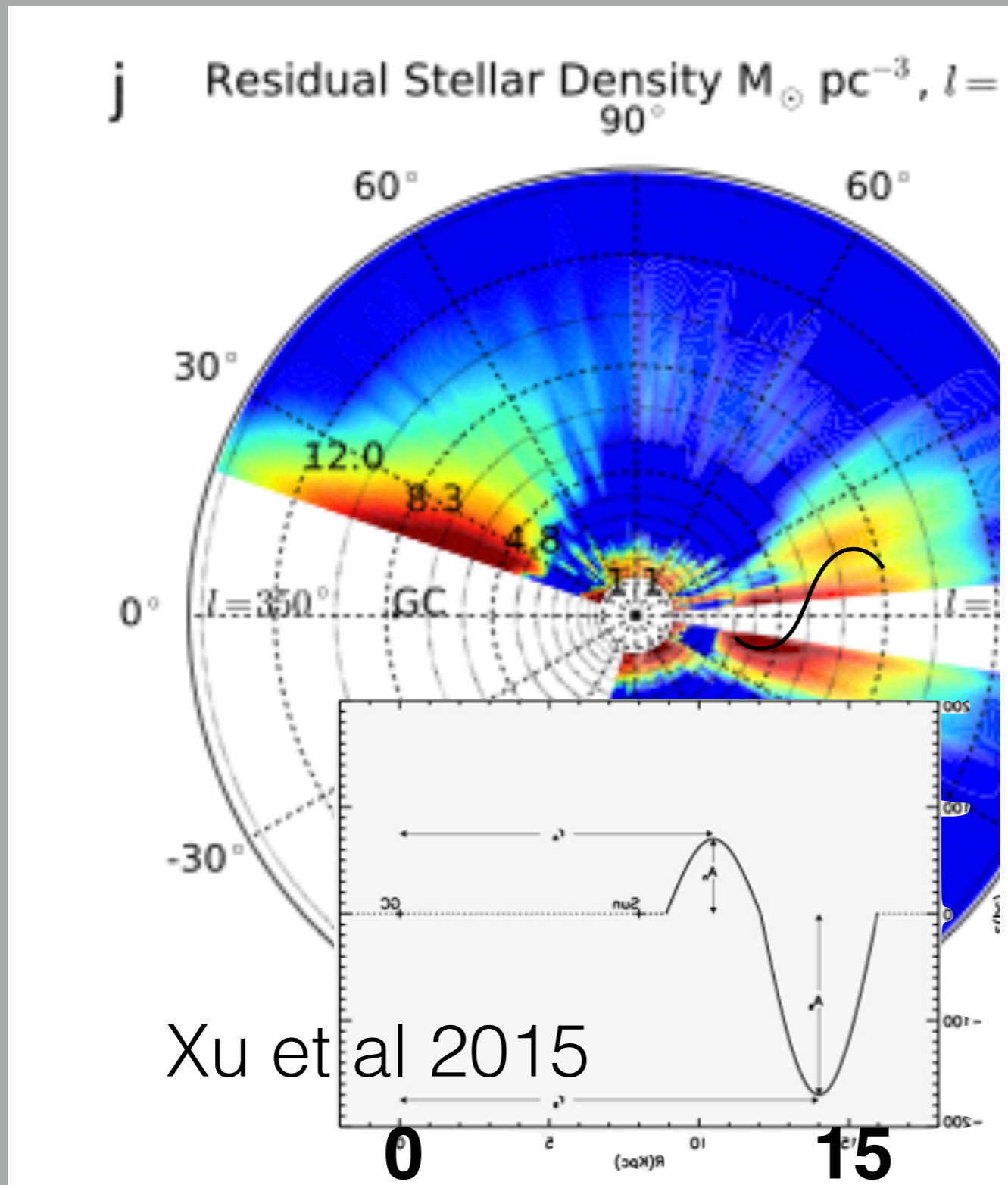
Structures in the disk



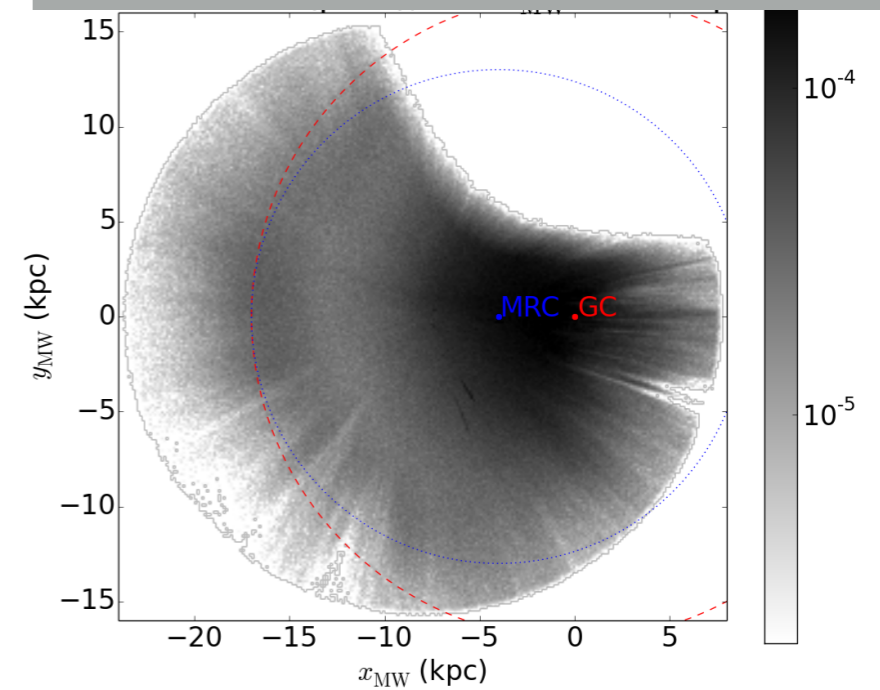
Structures in the disk



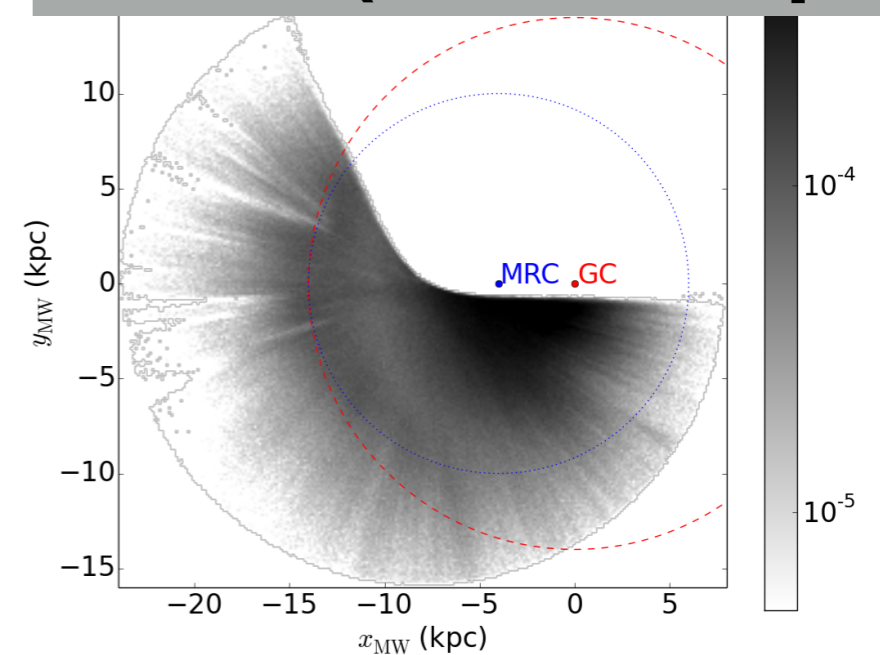
Structures in the disk



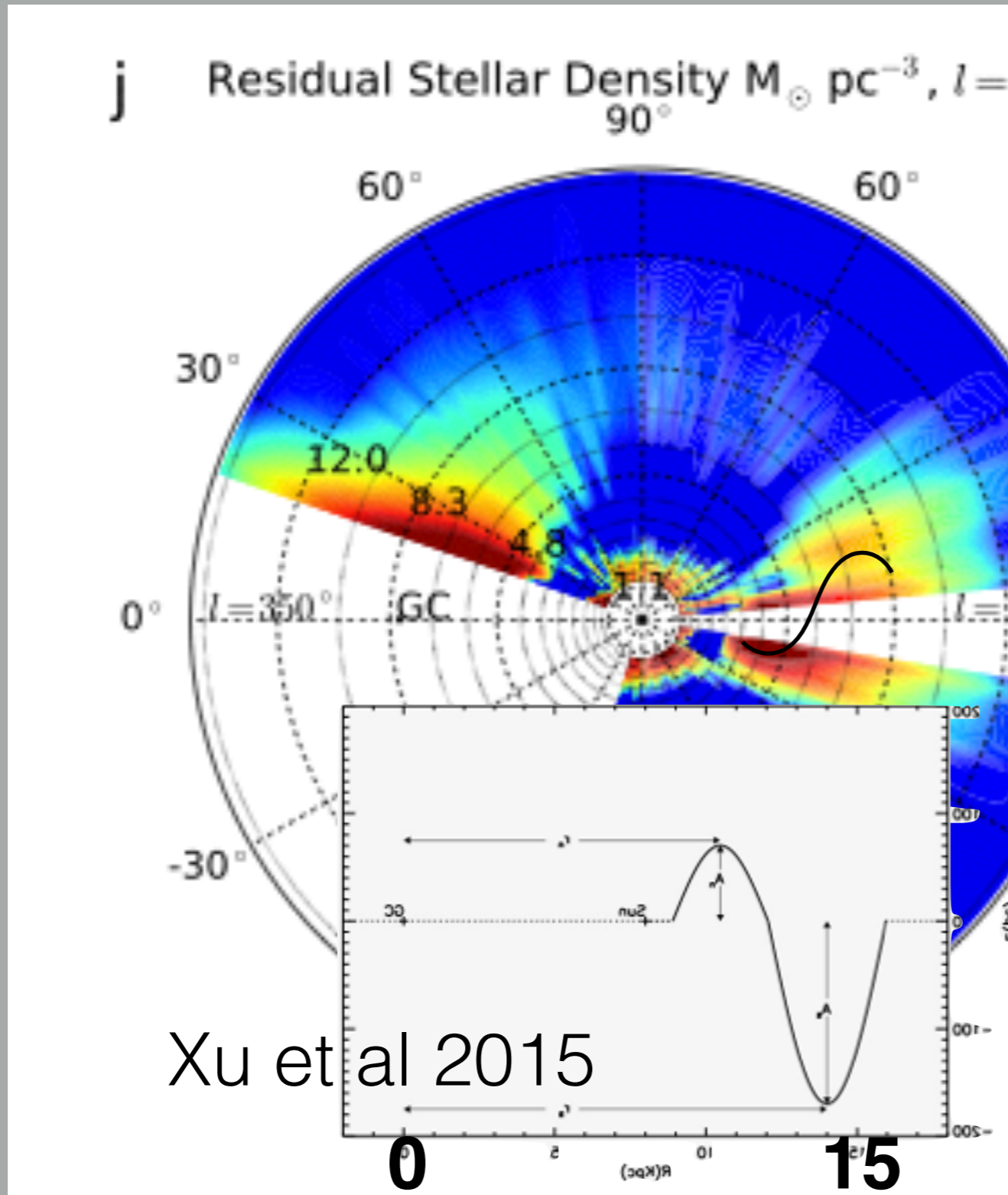
North ($3 < z < 4.5$ kpc)



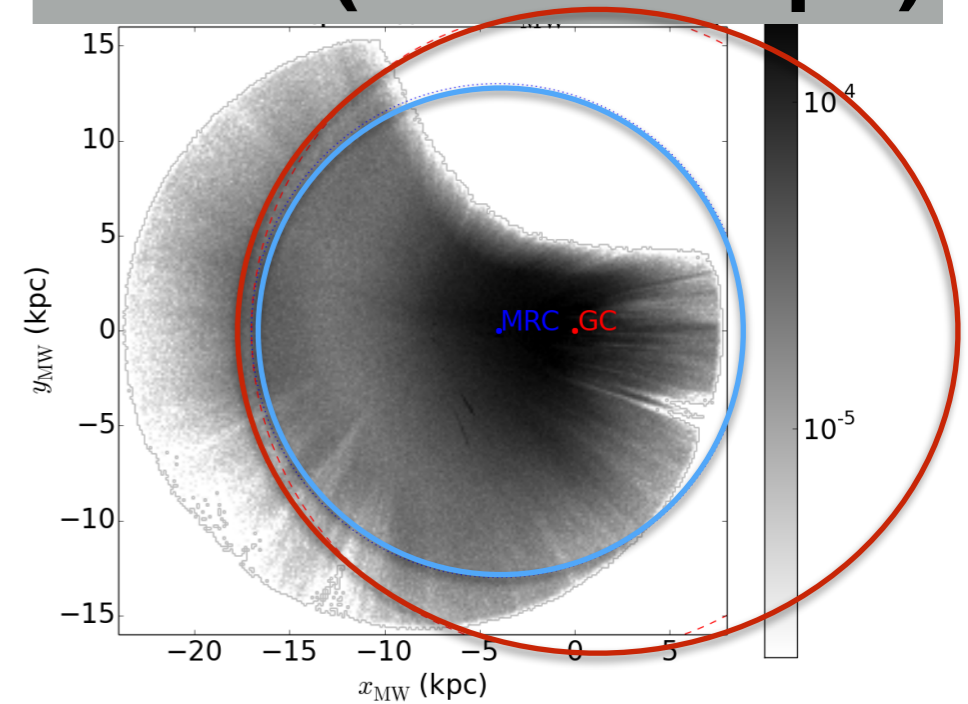
South ($-3 < z < -2$ kpc)



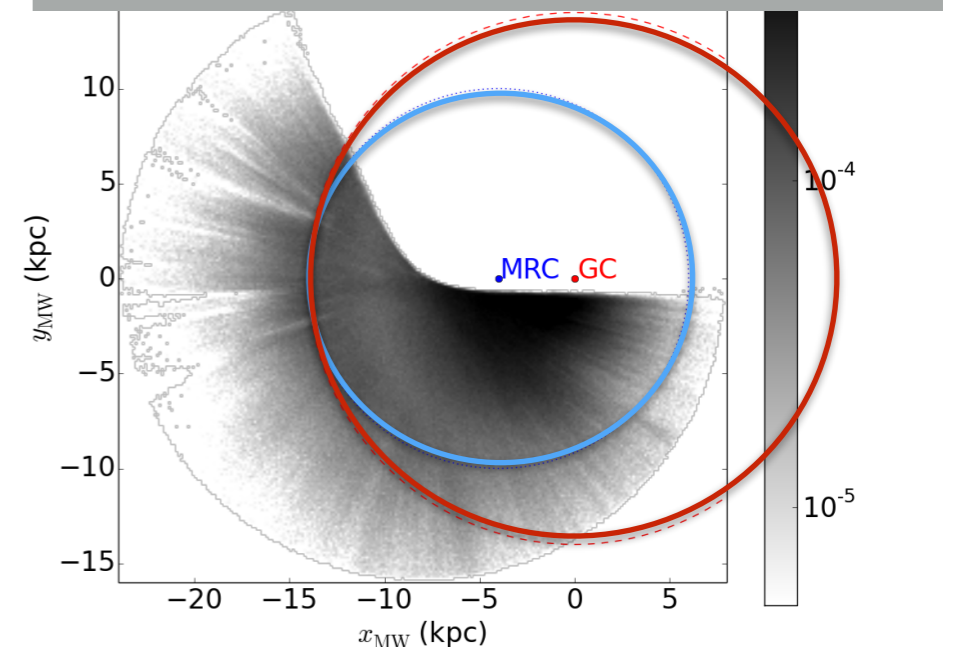
Structures in the disk



North ($3 < z < 4.5$ kpc)



South ($-3 < z < -2$ kpc)

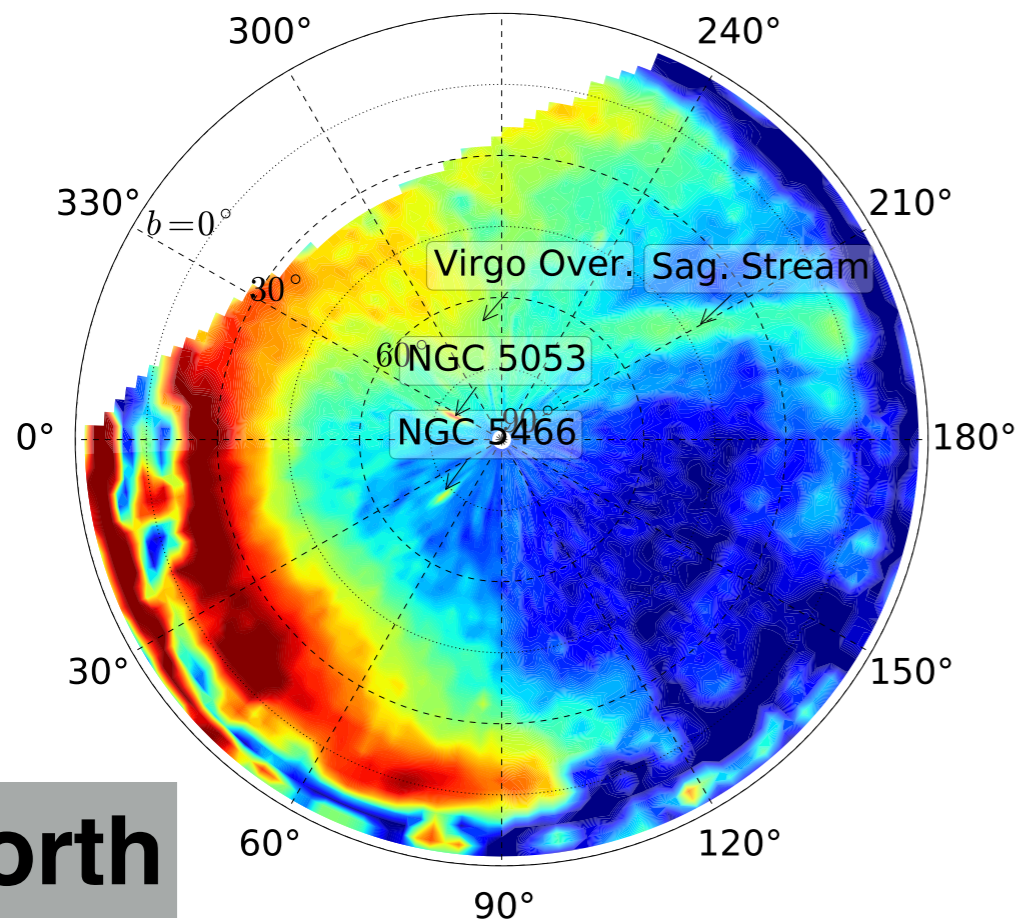


Summary

- The outer disk is complicated, lumpy and still interesting
- PanSTARRS coverage is providing a fantastic panorama on all these regions and will improve further with the stacked data.
- PanSTARRS analysis - Colour-Magnitude Diagram fitting is finding structures in the Disk and allowing us to trace them.
- Monoceros is a ... stream, flare, ripple?
As Xu et al 2015 state it could be that it's a radial warp with components from the disk and accreted satellites.
- Monoceros and the outer disk will not be a mystery for much longer.

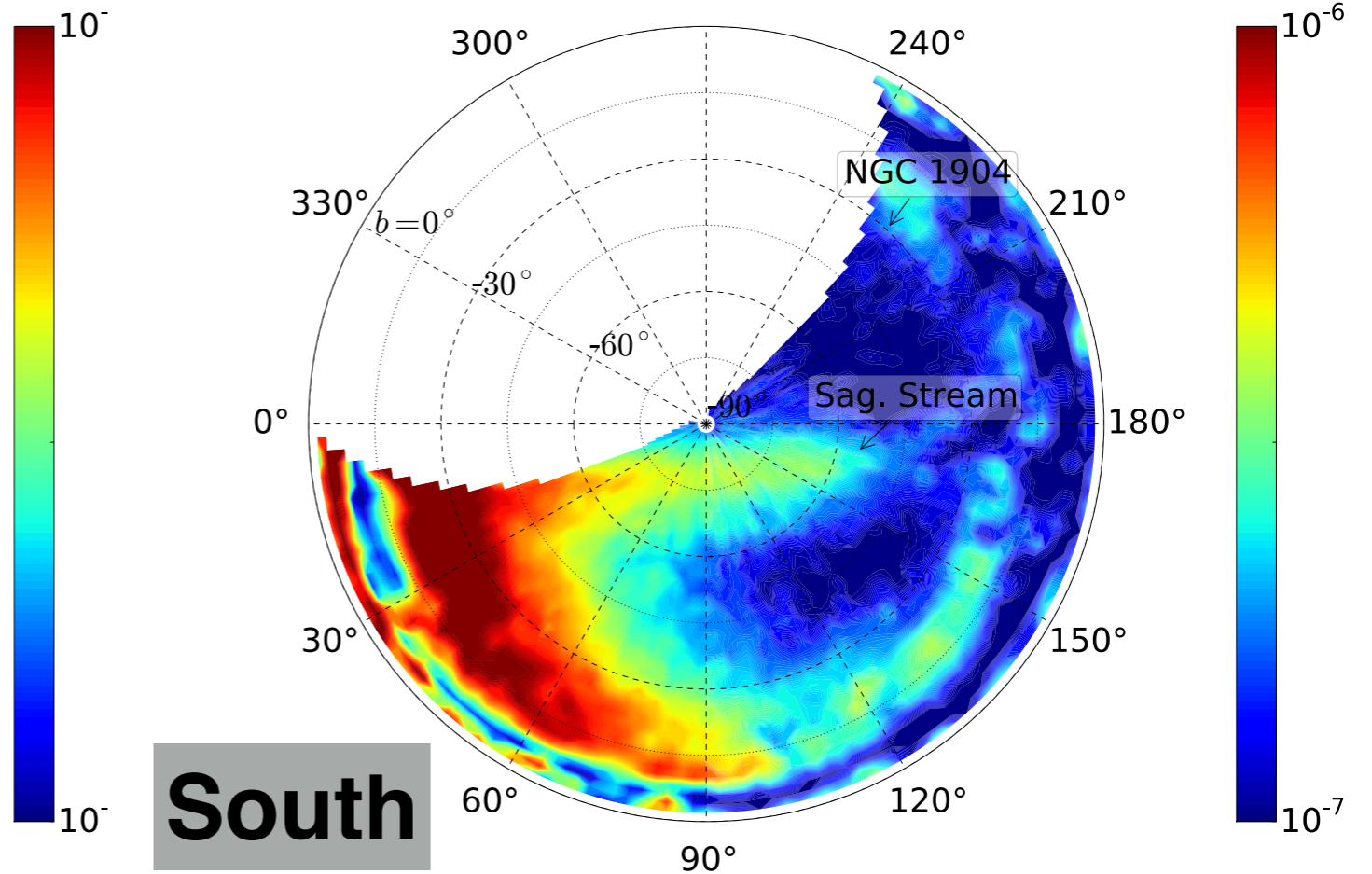
Sagittarius in PanSTARRS

Total Northern Stellar Density $M_{\odot} \text{ pc}^{-3}$, $d=17.4 \text{ kpc}$



North

Total Southern Stellar Density $M_{\odot} \text{ pc}^{-3}$, $d=17.4 \text{ kpc}$



South

