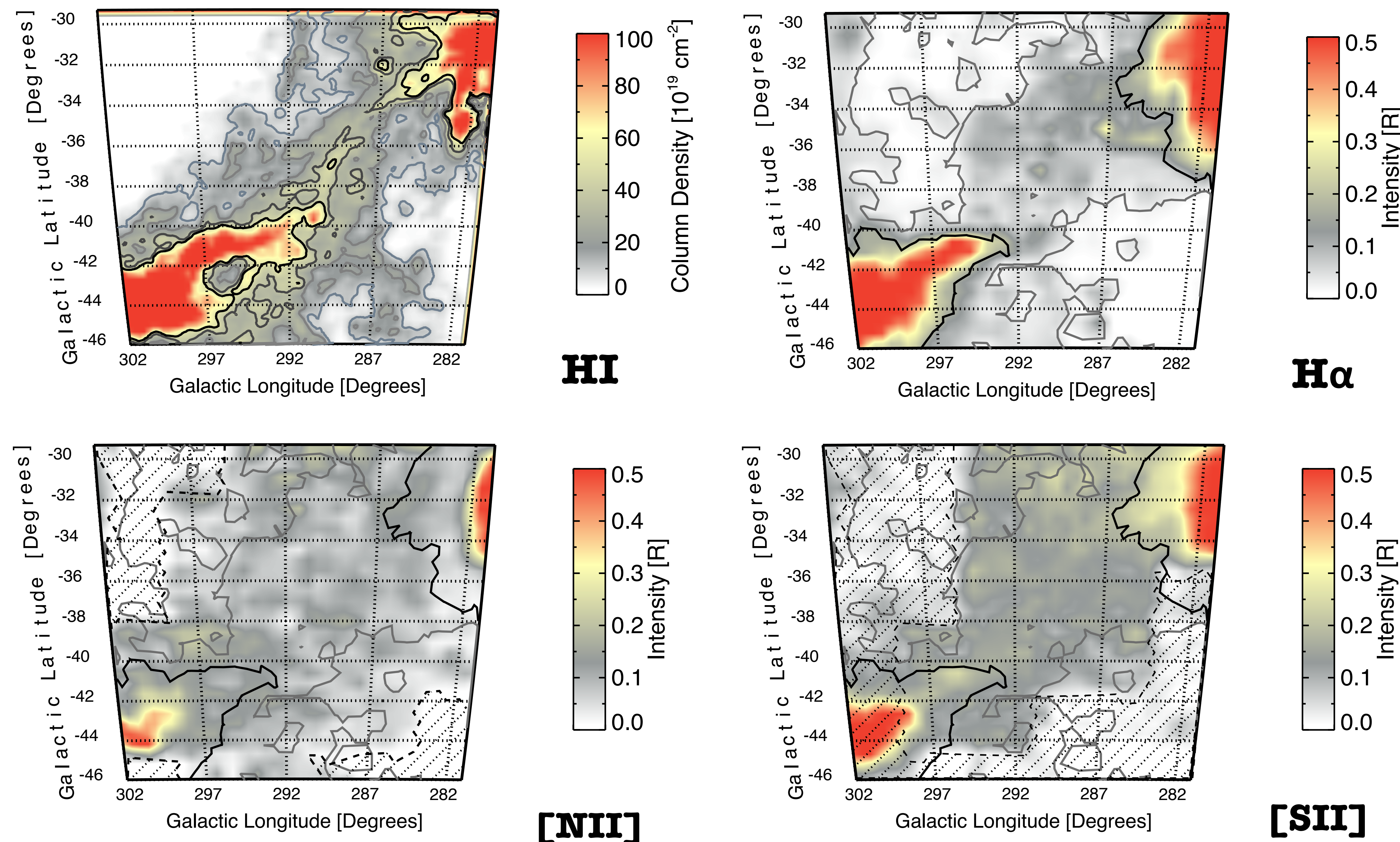
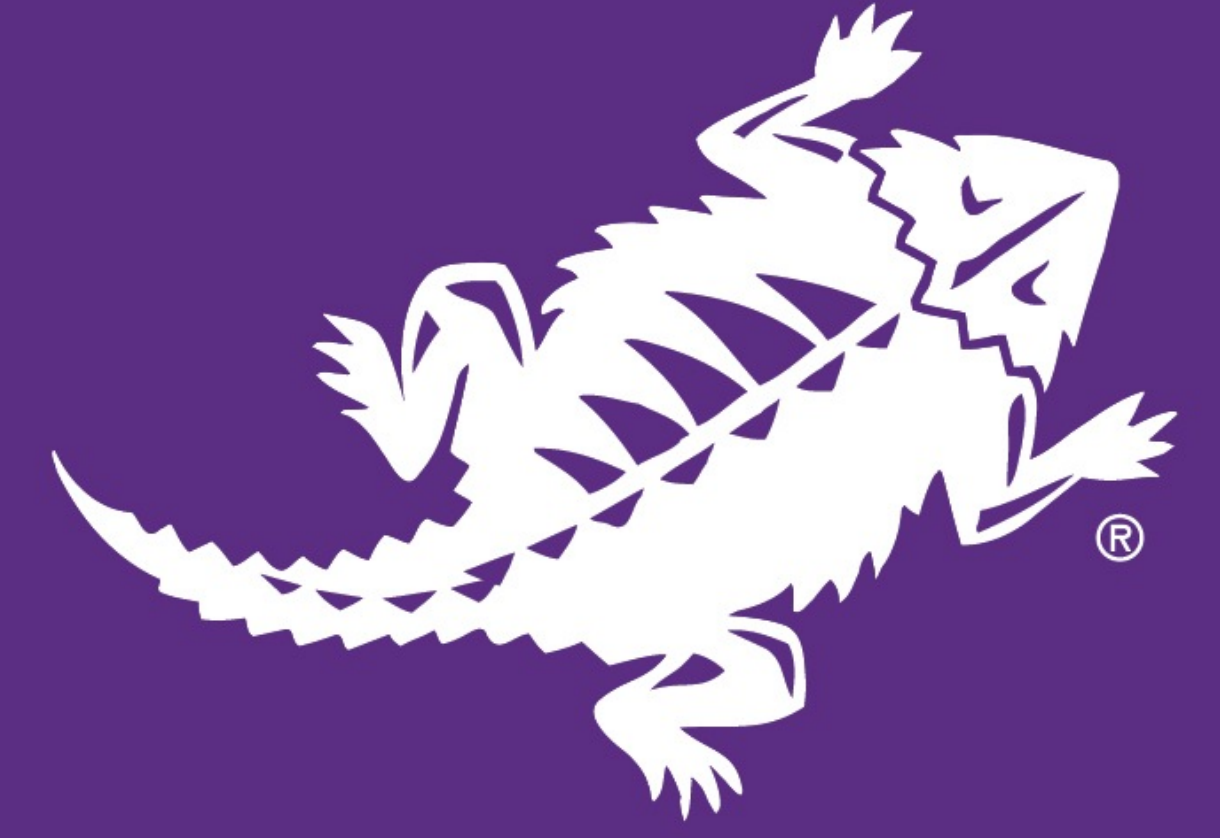




Physical Properties of the Magellanic Bridge Tidal Remnant through Mapped $H\alpha$, [SII], and [NII] Emission

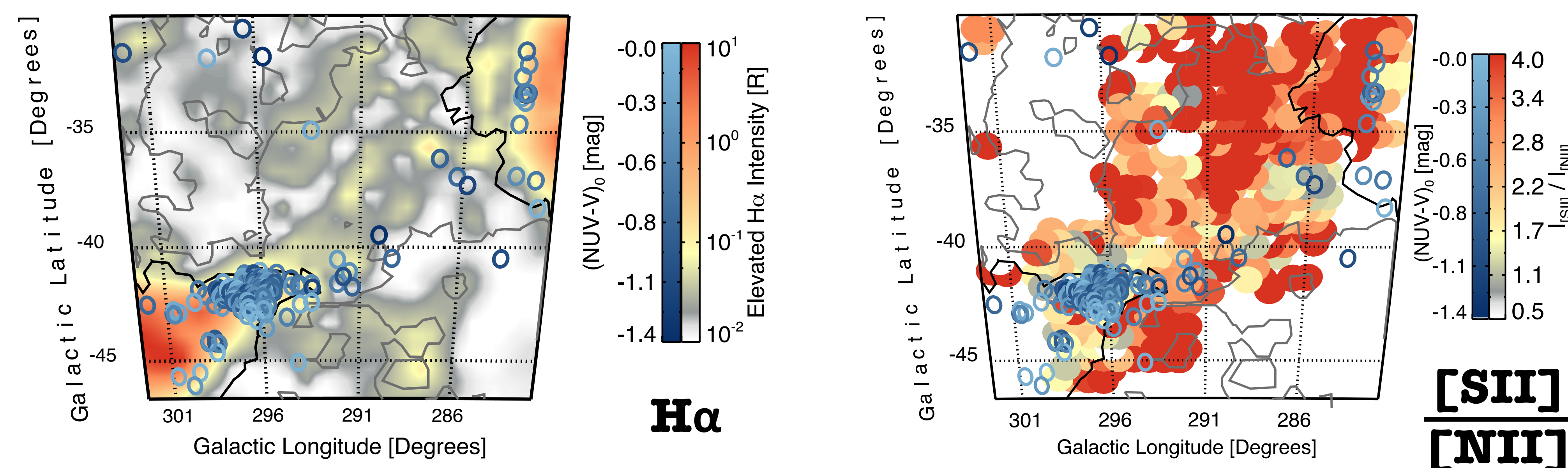
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$H\text{I}^\ddagger$, $H\alpha^\ddagger$, [NII], and [SII] emission maps over the $+100 \leq v_{\text{LSR}} \leq +300$ km/s velocity range observed with WHAM.

[‡]The HI (GASS Survey) & $H\alpha$ (WHAM) maps are reproduced from Barger et al. (2013).

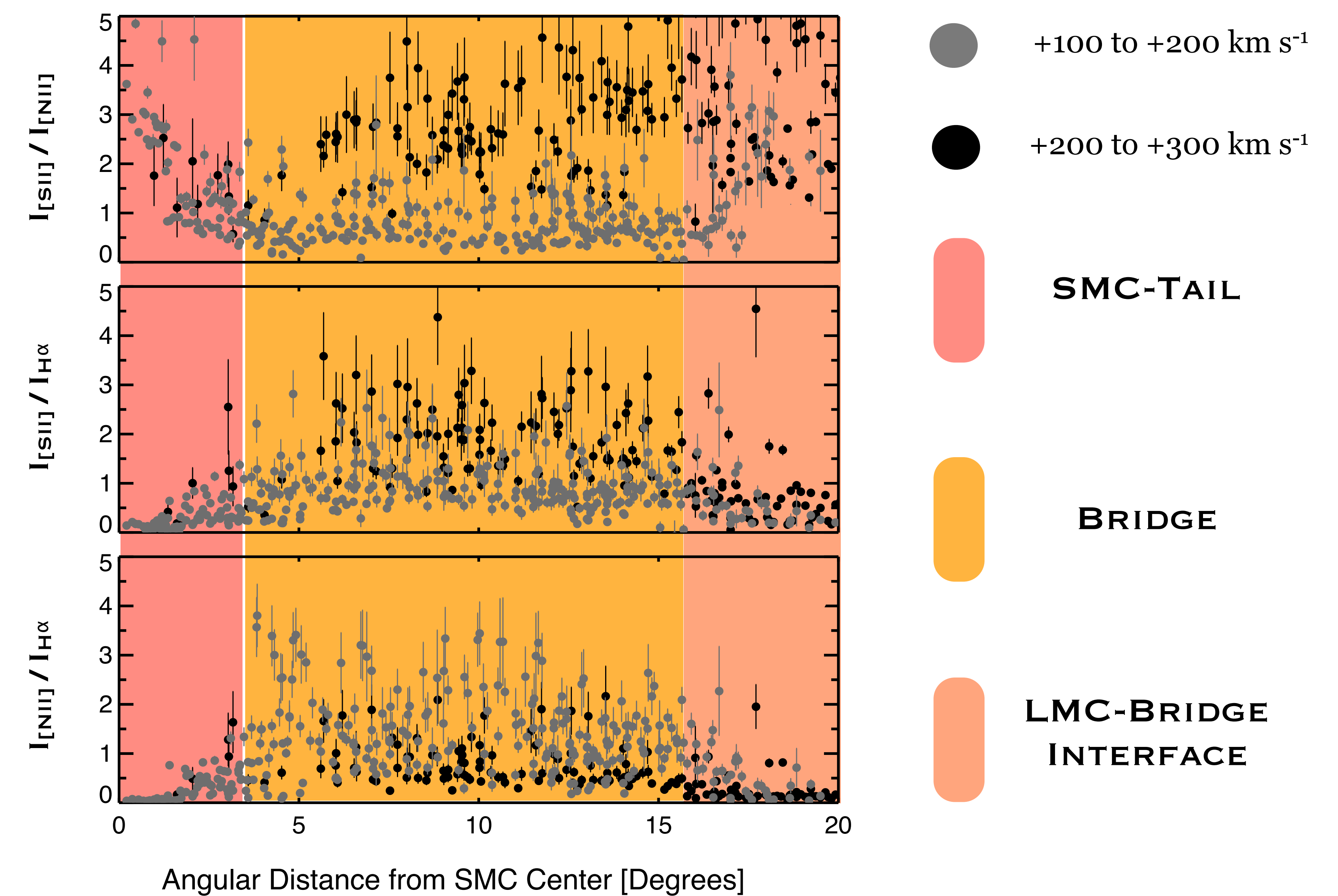


Left: Elevated $H\alpha$ emission compared to neighboring sight lines that does not correlate well with star formation

Right: $I_{[\text{SII}]} / I_{[\text{NII}]}$ for the high velocity filament. A ridge of gas extending from the high-latitude edge of the $H\alpha$ SMC-Tail to low latitude edge LMC-Bridge interface has a lower ratio that tracks recent star formation

[‡]The blue circles mark the locations of O and B stars (Casetti-Dinescu et al. 2012)

We present the first kinematically resolved [S II] $\lambda 6716$ and [N II] $\lambda 6583$ emission maps of the entire Magellanic Bridge that were observed with the Wisconsin $H\alpha$ Mapper (WHAM) Telescope. Combining these maps with the complementary $H\alpha$ maps of Barger et al. (2013), we explore the temperature, sulfur and nitrogen ionization state, and sources of the ionization of the warm-ionized gas in the Magellanic Bridge, the SMC-Tail, and the LMC-Bridge interface region. Within the Magellanic Bridge, we find that the low velocity ($+100 \leq v_{\text{LSR}} \leq +200$ km/s) and the high velocity ($+200 \leq v_{\text{LSR}} \leq +300$ km/s) gas have different properties, suggesting that it is composed of at least two separate and coherent filaments. Within the high-velocity filament, a high-velocity ridge of gas—with different properties from the high-velocity structure—extends along the high-latitude edge of the $H\alpha$ SMC-Tail to low latitude edge LMC-Bridge interface. This ridge coincides with a strip of early-type stars, suggesting that these stars are influencing this gas. We further find that the properties of both the SMC-Tail and LMC-Bridge interface regions have similar properties and therefore are likely affected by similar ionization sources.



Bridge: T_e and S^+/N^+ are lower in the low velocity filament than in the high velocity filament

Ridge: T_e and S^+/N^+ are lower than in the high velocity filament and tracks the star formation

SMC-Tail & LMC-Bridge Interface: T_e and S^+/N^+ increases towards the Bridge as n_e and $I_{H\alpha}$ decreases

Barger, Haffner, Bland–Hawthorn 2013, ApJ, 771, 132

Casetti-Dinescu et al. 2012, ApJ, 753, 123

Galactic All Sky Survey (GASS): McClure–Griffiths et al. 2009, ApJS, 181, 398; Kalberla et al. 2010, A&A, 512, A14; Kalberla & Haud 2015, A&A, 578, A78

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