

The Diffuse Ionized Gas of the Magellanic Cloud System

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The Magellanic Cloud System is an excellent observational target for exploring the warm ionized medium (WIM), acting as a bridge between Milky Way observations and extragalactic observations. H α emission from the WIM is often faint (>1 R) [1], requiring highly sensitive instruments to observe its full extent. Using the Wisconsin-Alpha Mapper's (WHAM) highly sensitive spectrograph (~ 20 mR), our survey of H α emission provides the first comprehensive look at the diffuse ionized gas content of the Magellanic Cloud System.

Here we present the combined results from the Large and Small Magellanic Cloud surveys with early results from the Magellanic Stream Survey to provide a comprehensive picture of the diffuse ionized gas content in the Magellanic System, exploring the morphology, velocity, and mass of the ionized gas. With the completion of the Small Magellanic Cloud Survey [2] and the Large Magellanic Cloud Survey [3], many previously unknown ionized structures have been revealed, expanding our understanding of the structure of the galaxies. The addition of the Stream reveals the H α emission continues beyond the galaxies alongside the neutral hydrogen Stream. Together, all three surveys reveal a highly ionized system disturbed by galaxy interactions, and provides new insight into the morphology and velocity structure of the diffuse ionized gas.

References

[1] Haffner, L. M., Reynolds, R. J., Tufte, S. L., et al., *ApJS*, 149, 405 [2003]

[2] Smart, B. M., et al., *ApJ*, 887, 16 [2019]

[3] Smart, B. M., et al., *ApJ*, [2022 Under review]