

Detecting HII Regions in the Outer Scutum- Centaurus Arm

**A. Johnson¹, W. Armentrout², L. Anderson³, T. Bania⁴, D. Balser⁵,
T. Wenger⁶**

¹Pacific Lutheran University, Tacoma, WA, ²Green Bank Observatory, Green Bank, WV,

³West Virginia University, Morgantown, WV, ⁴Boston University, Boston, MA,

⁵National Radio Astronomy Observatory, Charlottesville, WV,

⁶Dominion Radio Astrophysical Observatory, Kaleder, BC, Canada

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There is relatively little known about Galactic star formation in the outer edges of the Milky Way, particularly in the Outer Scutum-Centaurus spiral arm (OSC). Lying about 15 kpc from the center of the Galaxy, the OSC was discovered in 2011 and is the most distant molecular spiral arm of the Milky Way. The OSC warps up to 4 degrees above the Galactic plane and as a result, has been excluded from the scope of many surveys of the Galactic plane, typically confined to a single degree above or below the plane. The goal of our study is to identify radio continuum from HII regions in the OSC in order to better understand the population of high-mass star formation regions in the outer Galaxy. We observed 12 HII Regions in the OSC using the Very Large Array at 10 GHz. Of our 12 targets, 7 are re-observations of undetected sources from Armentrout et al. (2017). The remaining 5 targets are sources without previously observed 10 GHz radio continuum data. We identify 10 GHz radio continuum associated with 7 of our OSC HII region targets for the first time. Assuming one dominant ionizing source per HII region, we assign spectral types from O9 to O5.5 for these sources, depending on their distance and continuum intensity. The remaining 5 nondetections represent lower-mass (B-type) star-forming regions below the sensitivity limit of our survey. These regions represent very high-mass star formation on the outer edge of the Galaxy, where densities and metallicities might be more similar to that of a much younger Milky Way or lower mass galaxies like the Magellanic Clouds.