

Centennial Honors College
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ABSTRACT

Major: Physics

Poster

Faculty Mentor(s): Esteban Araya

Continuum and Methanol Maser Variability in the Orion Nebula

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The VLA Orion Large Survey (VOLS) is an international collaboration that is conducting a large field of view and high angular resolution radio survey of the Orion Nebula (an area known for multiple stages of star formation) using the Very Large Array radio telescope. The Orion Nebula contains regions of ionized gas that emit radio continuum radiation and regions from where intense spectral line emission from different molecules has been found, including methanol (CH₃OH) masers. One of the goals of the VOLS project is to detect variability of CH₃OH masers, which could provide insights of the star formation process occurring in the Orion Nebula. To have reliable measurements of CH₃OH variability, we need to identify radio continuum sources near the CH₃OH masers to be used as positive controls. Using the continuum sources listed in Felli et al. (1993), we selected six sources as controls, with the addition of two sources that we found in our data but were not reported in their paper. One radio source was offset with respect to the original position, which could have been caused by proper motion or variability. However, we analyzed another epoch and found a radio continuum source at the original expected position in addition to the newly detected source, indicating variability. We discuss the properties of the other continuum sources that will be used as controls for the study of CH₃OH maser variability in Orion. This work is based on data from VOLS (P.I. G. Busquet), and is partially supported by NSF grants AST-1814063 and AST-1814011, and computational resources donated by WIU Distinguished Alumnus Frank Rodeffer.