

Western Illinois University
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Abstract

Live Poster Session

Major: Physics

Faculty Mentor: Esteban Araya

A Molecular Line Study of High-Mass Star Forming Regions: from Outflows to the Interaction of Molecular Filaments

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High-mass stars are stars that are more than 8x the mass of the sun and form in molecular clouds. Using the 305m Arecibo Radio Telescope, we conducted observations of three transitions of CH towards a sample of 37 high-mass star forming regions. These regions were selected because of evidence of active outflows based on infrared data from the Spitzer Space Telescope. We detected 3263.794 MHz CH toward 20 sources, 3335.481 MHz CH toward 22 sources, and 3349.193 MHz CH toward 11 sources. Based on the presence of line-wings, we identified 8 sources in which the CH lines could be associated with molecular outflows. The case of two specific star forming regions (G35.79-0.17 and G35.83-0.20) will be discussed in detail. In these sources, we detected two velocity components in all three CH transitions at 28 and 60 km/s, which corresponds to the systemic velocity of both sources. A Spitzer-IRAC image of the region shows a large-scale infrared dark cloud filament, where both pointing positions are located. We discuss the possibility that the spectral lines are revealing the interaction of molecular clouds responsible for triggering star formation in this filament.