Identifying the Source of a Hydroxyl Outflow in a Region of High-Mass Star Formation

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High-mass stars (stars with masses above 8 times the mass of the Sun) generate great amounts of energy, more than several thousand times the energy generated by the Sun. At present, the mechanism that leads to the formation of these stars is unclear. Observations have shown that high-mass stars form in giant clouds of dust and gas, and while forming, can drive large scale outflows that push material outwards. A region of high-mass star formation in our Galaxy is G34.26+0.15, where evidence of an outflow was detected in a transition of the molecule hydroxyl (OH) based on low-angular resolution observations. Previous radio continuum observations also showed multiple ionized regions in G34.26+0.15, including cometary-shaped and compact ionized sources. The purpose of this project was to analyze high angular resolution observations of OH obtained with the Very Large Array (VLA) telescope to determine whether the outflow originates from the cometary-shaped ionized region or the more compact ionized sources. Specialized programs (VNC, PUTTY) were used to connect to a remote computer cluster in New Mexico. The Common Astronomy Software Applications (CASA) program was used in the remote cluster to obtain images and spectra from the VLA observations. It was hypothesized that the absorption detected in the G34.26+0.15 region would appear in front of the Southeast compact region of ionized gas. The raster image shows that the absorption was not tracing the Southeast compact region, but rather is located toward the cometary-shaped region.

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