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Emission Line Observations of Ionized Gas in Isolated, Compact High-Velocity Interstellar Clouds DAVID HONEGGER, Lewis & Clark College — The interstellar medium is just as important as stars when considering how galaxies such as our own evolve. A better understanding of the interstellar medium, including a subset of clouds at anomalously high velocities (known as high-velocity clouds or HVCs), promises to shed some light on this process. It may be that the high-velocity interstellar material associated with the 21-cm radiation of neutral hydrogen is evidence that the Milky Way is not fully mature, but rather in an ongoing formative process. Although some high-velocity clouds have been shown to be located within the galactic sphere, propositions have been made that some compact and isolated HVCs may actually be massive intergalactic clouds. I used the Wisconsin Hα Mapper (WHαM), a telescope specifically designed to detect the faint emissions of ionized gas in the diffuse interstellar medium, to measure the levels of ionized hydrogen, nitrogen, sulfur, and doubly ionized oxygen in a sample of compact, isolated clouds. This information can be used to approximate the cloud's distance from the Milky Way's galactic plane. The majority of the sampled HVCs exhibited weak, yet detectable hydrogen emission, which is bright enough to indicate that those clouds are not intergalactic. However, three of the clouds yielded non-detections, providing tight upper limits on the metagalactic ionizing flux.

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