NEW BACKGROUND INFRARED SOURCES FOR STUDYING THE GALACTIC CENTER’S INTERSTELLAR GAS

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We are nearing completion of a low-resolution 2.0-2.5 µm (4000-5000 cm\(^{-1}\)) survey of ~500 very red point-like objects in the Central Molecular Zone (CMZ) of the Milky Way Galaxy. The goal is to find bright objects with intrinsically featureless or nearly featureless spectra that are suitable as background light sources for high-resolution infrared absorption spectroscopy of H\(^3\)\(_2\) and CO in the Galactic center’s interstellar gas, on sightlines spread across the CMZ. Until recently very few such objects had been known outside of two clusters of hot and luminous stars close to the very center. We have used Spitzer Space Telescope 3.6–8.0-µm photometry and 2-Micron All Sky Survey 1.0–2.5-µm photometry to identify candidates with a significant probability of being stars embedded in circumstellar dust, and over the last several years have been acquiring low resolution spectra of them to determine their natures. The low resolution spectra, which encompass the wavelengths of the first overtone band heads of CO, which are prominent in cool stellar photospheres, show that by far the majority of candidates are very cool and/or highly reddened red giants, which are unsuitable as background sources because of their complex spectra. However, approximately ten percent of the candidates have featureless or nearly featureless spectra and are useful for investigations of the interstellar gas. Most of these have continua rising steeply to longer wavelengths and are luminous, dust embedded stars.