Characterising the Protostellar Population of the Magellanic Clouds with VLT/SINFONI

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Abundances of metallic atoms, molecules and dust in environments have the potential to profoundly affect star formation. Radiation via the fine-structure lines of carbon and oxygen and the rotational transitions of molecules such as CO dissipate heat, allowing cloud contraction. Self-shielding dusty discs allow for continued accretion onto massive protostars, allowing the formation of stellar objects with masses in excess of $10M_{\odot}$. Despite its obvious importance, the effects of metallicity on the development of massive protostars remains poorly understood.

The Magellanic Clouds provide the closest templates of metal-poor extragalactic star forming regions with metallicities of $\sim 0.2Z_{\odot}$ and $\sim 0.4Z_{\odot}$ for the Small Magellanic Cloud (SMC) and the Large Magellanic Cloud (LMC) respectively. We present K-band Integral Field Spectroscopy for a set of 20 Massive Young Stellar Object candidates in the Small Magellanic Cloud and 3 in the Large Magellanic Cloud obtained using SINFONI at the VLT. The objects were originally selected using Spitzer photometry and are well characterised in the mid- to far-IR with observed properties ranging from deeply embedded ice rich objects to compact HII regions.

With an angular resolution of 0.1" we have produced high resolution K-band images of YSOs in the Magellanic Clouds, allowing us to resolve groups of young objects. The objects observed display a variety of morphologies in emission line features, echoing the complex physical mechanisms of YSOs and the different evolutionary states of the objects. The K-band contains a wide array of useful spectral diagnostics, including $Br\gamma$ which traces accretion and HII regions and H_2 which can be used to trace the shock fronts of outflows, for which we obtained flux and velocity maps. Through the characterisation of the morphologies and spectra of YSOs in the Magellanic Clouds and through detailed comparison with their massive counterparts in the Milky Way we aim to constrain how metallicity affects protostellar evolution.

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