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The MUSE Atlas of Disks (MAD): Ionized gas properties in local galaxies.

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Abstract

We study the physical properties of the ionized gas in local disks using the sample of 38 nearby $\sim 10^{8.5-11.2} M_{\odot}$ Star-Forming Main Sequence (SFMS) galaxies observed so far as part of the MUSE Atlas of Disks (MAD). Specifically, we use all strong emission lines in the MUSE wavelength range 4650-9300 Å to investigate the resolved ionized gas properties on $\sim$100 pc scales. This spatial resolution enables us to disentangle HII regions from the Diffuse Ionized Gas (DIG) in the computation of gas metallicities and Star Formation Rates (SFRs) of star forming regions. The gas metallicities generally decrease with radius. The metallicity of the HII regions is on average $\sim$0.1 dex higher than that of the DIG, but the metallicity radial gradient in both components is similar. The mean metallicities within the inner galaxy cores correlate with the total stellar mass of the galaxies. On our $<$100 pc scales, we find two correlations previously reported at kpc scales: a spatially resolved Mass-Metallicity Relation (RMZR) and a spatially resolved SFMS (RSFMS). We find no secondary dependency of the resolved RMZR with the SFR density. We find that both resolved relations have a local origin, as they do not depend on the total stellar mass. (See poster).