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High spectral resolution observations in the disk settling epoch

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Disk galaxies have changed dramatically over the past 12 Gyr, with disk velocity dispersions falling by an order of magnitude from ~100 km/s to 10 km/s. However the rate of this change is unconstrained at z~0.2-0.6 where models predict that star forming galaxies are settling into a more secular phase than the violent disk instability phase preceding it at z≥1. During this key epoch the main driver of turbulence in star-forming disks may be transitioning from gravity-driven to feedback-driven processes. I will present recent results (Wisnioski et al. in prep) of 10 disk galaxies z=0.2-0.4 with both high (R~8000) and low (R~2500) spectral resolution IFS and long-slit observations (MUSE, FLAMES, X-Shooter). This data set demonstrates the limitations of recovering velocity dispersions below the instrumental resolution and provides the first detailed measurement of disk dispersion at this epoch. Our limited sample will provide constraints for the driving mechanism of the turbulence in star-forming galaxies during the disk settling epoch. With MAVIS we will be able to more efficiently and systematically explore the relationship between SF, turbulence, and morphology, at <1kpc scale, with the combination of high spectral and spatial resolution IFS.

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