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A microshutter-based field selector for JWST's multi-object near infrared spectrograph

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Conference Title: Infrared Spaceborne Remote Sensing and Instrumentation XV

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One of the James Webb Space Telescope's (JWST) primary science goals is to characterize the epoch of galaxy formation in the universe and observe the first galaxies and clusters of galaxies. This goal requires multi-band imaging and spectroscopic data in the near infrared portion of the spectrum for large numbers of very faint galaxies. Because such objects are sparse on the sky at the JWST resolution, a multi-object spectrograph is necessary to efficiently carry out the required observations. We have developed a fully programmable array of microshutters that will be used as the field selector for the multi-object Near Infrared Spectrograph (NIRSpec) on JWST. This device allows apertures to be opened at the locations of selected galaxies in the field of view while blocking other

unwanted light from the sky background and bright sources. In practice, greater than 100 objects within the field of view can be observed simultaneously. This field selection capability greatly improves the sensitivity and efficiency of NIRSpec. In this paper, we describe the microshutter arrays, their development, characteristics, fabrication, testing, and progress toward delivery of a flight-qualified field selection subsystem to the NIRSpec instrument team.

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