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How to Apply Machine Learning to
Experimental & Theoretical
PHYSICS

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Investigating noise patterns in the JWST/MIRI detector with ML techniques

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The James Webb Space Telescope is helping astronomers to push back the frontiers of observability. This is particularly true for exoplanets, as we are now looking at small, terrestrial planets, searching for hints of an atmosphere. These signals are very small, and as with every new instrument, most systematics (and their source) remain very poorly understood. In an effort to investigate possible patterns in the JWST/MIRI detector responsible for the correlated noise observed in the light-curves, I apply clustering techniques on each pixel's time series information. The results suggest that 1) There are no major gradients or positional patterns across the detector, 2) Cosmic rays/bright polluters "shock" individual pixels beyond their occurrence integration and 3) There seems to be at least one high frequency signal (whose source remains unknown), possibly polluting the light curves.

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