
Superresolving Herschel imaging: a proof of concept using Deep Neural Networks

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Abstract

Wide-field submillimetre surveys have driven many major advances in galaxy evolution in the past decade, but without extensive follow-up observations the coarse angular resolution of these surveys limits the science exploitation. This has driven the development of various analytical deconvolution methods. In the last half a decade Generative Adversarial Networks have been used to attempt deconvolutions on optical data. We have developed an auto-encoder with a novel loss function to overcome this problem in the submillimeter wavelength range. This approach works on Herschel SPIRE 500 μm COSMOS data, with the superresolving target being the JCMT SCUBA-2 450 μm observations of the same field. The auto-encoder reproduces the JCMT SCUBA-2 images with high fidelity. This is quantified through the point source fluxes and positions, the completeness, and the purity.

Slides: in PDF

Video: <https://youtu.be/uHlycbhOkGM>

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