

On the Performance of Autoencoder-Based Space Optical Communications

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Abstract—In this paper, we propose a deep learning autoencoder (AE) to model and design space optical communications (SOC) systems from end-to-end performance. The proposed AE is based on multiple-decoders and a new layered structure for constructing both encoders and decoders. The use of multiple-decoders can increase the receiver diversity, which allows the gradient descent to minimize the cost function compared to

proportional to the light intensity and governed by a non-negativity constraints. When a photo-detector detects the light, it generates a signal that is proportional to the intensity of the light received and contaminated by noise [3], [4].

RF channel is well-understood as it is a mature research topic and related research has been ongoing for more than