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A Deep Learning Approach to Infer Galaxy Cluster Masses in Planck Compton parameter maps

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In this work, we evaluate for the first time Convolutional Neural Networks(CNNs) to infer the masses of observed galaxy clusters in the Planck Compton parameter maps. We train our network using simulated maps from the THREE HUNDRED SIMULATION project up to redshiftz of order 1 and test our model on real Planck Sunyaev-Zel'dovich (SZ) maps. Our data set consists on 191862 mock maps, which are based on 7106 different clusters from our simulations, and 1094 observed SZ maps. Furthermore, we train 4 separate CNNs for different redshifts intervals between z=0 and z=1. We show that our results are compatible with Planck estimates of the mass and also with weak lensing measurements

Primary authors: DE ANDRES, Daniel (Universidad Autonoma de Madrid); DE PETRIS, Marco (ROMA1); RUPPIN, Florian (MIT); CUI, Weiguang; Prof. YEPES, Gustavo (UAM)

Presenter: DE ANDRES, Daniel (Universidad Autonoma de Madrid)