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2D Machine learning modeling of space weather NICOLETTE CLARK, MATTHEW MCHARG, CASEY PELLIZZARI, GABRIEL WILSON, United States Air Force Academy — A real-time map of space weather provides an operational advantage to satellite missions. In this paper, we present a technique for modelling ionospheric plasma density in two dimensions based on sparsely-sampled data from a single satellite. Three global magnetic indices, along with location and solar elevation angle, are used as the drivers for a feed-forward neural network model of ionospheric space weather. In situ measurements taken by an integrated miniaturized electrostatic analyzer are used as target values for training the network. The model results are used to construct a two-dimensional map of ionospheric conditions, which we then compare to International Reference Ionosphere data as an external validation measure. PA Number: USAFA-DF-2020-330.

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