

INVERSION OF ROCKET-BORNE PHOTOMETER MEASUREMENTS BY AN ARTIFICIAL NEURAL NETWORK TECHNIQUE

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The inverse problem to retrieve useful airglow volume emission rate profiles from rocket-borne photometer measurements has been solved by adopting the well-characterized spectral photometric methods. An alternative recovery method based on artificial neural network (ANN) is presented. In this work, a multilayer perceptron neural network was trained with a range of cases from the empirical and experimental volume emission rate profiles. A numerical experiment was also carried out with synthetic experimental data considering a noise level of 5%. Integrated emission profiles measured by a Brazilian sounding rocket experiment launched from an Equatorial station were taken as the input data. From the results obtained it may be concluded that the ANN technique is a convenient tool to recover volume emission rate profiles. The advantages of using neural network based systems are related to their intrinsic features of parallelism, after trained, the networks are much faster than traditional inversion approaches.

Artificial neural network, rocket-borne measurements, airglow

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