



# On the Minimum Free Energy for the Ionosphere

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**Abstract:** Within the linear theory of the electromagnetism for the ionosphere we give a general closed expression for the minimum free energy in terms of Fourier-transformed quantities, when the integrated history of the electric field is chosen to characterize the state of the material. Another equivalent expression is derived and also used to study the particular case of a discrete spectrum model.

**Keywords:** *Electromagnetism; fading memory; free energy.*

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