CAUSALITY AND DISPERSION RELATIONS: 2
THE TITCHMARSH THEOREM

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Preliminary abstract

The Titchmarsh Theorem [1] is a basic theorem which on general mathematical grounds explores the consequences of causality. It shows that any Square Integrable Function which is the Fourier Transform of a Causal Function satisfies certain relations which are called Dispersion Relations. We dwell upon mainly summarizing this theorem and on the required concepts in complex analysis like Principal value and Analytical Continuation.

References

[1] E. C. Titchmarsh, *Introduction to the theory of Fourier integrals*, 2nd ed., Clarendon Press, pp.119-128, 1948

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[3] J.Hilgevoord, *Dispersion Relations and Causal Description*, Amsterdam:North Holland, 1960

[4] H.Fearn and R.H.Gibb, *Dispersion relations and Relativistic Causality*, arXiv:quant-ph/ph/0310059 v3 30 Oct 2003