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8. Analysis

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Moment problem for hyperfunctions and the heat kernel method

We give a necessary and sufficient condition for a sequence to be the solution of the moment problem for hyperfunctions which is finding a hyperfunction u with compact support in $[-a, a]^n$ such that $\langle u, x^\alpha \rangle = \gamma_\alpha$ for each $\alpha \in \mathbb{N}_0^n$. It is a generalization of the moment problems for distributions and non–quasianalytic ultradistributions which was considered by Estrada–Kanwal and Cioranescu, respectively. Moreover we suggest simpler condition by using the heat kernel method and the characterization of periodic generalized functions instead of the representation of generalized functions as the boundary limits of analytic functions. Also, our method can allow us to treat this problems for various spaces of test functions and their dual spaces. in a unified manner.