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· 邱曙熙

平面负位势相关的Schrodinger方程的广义Picard原理

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摘要　设β是复平面上圆盘Ω_α={z||z|<α}内的一个零容紧致集.考虑Ω~β_α=Ω_α\β上的定常Schr〖AKo¨〗dinger方程(-Δ+μ)u=0,其中位势μ≤0是Kato类Radon测度.方程在广义函数意义下的连续解称为μ-调和函数.将在{z||z|=a}上取极限值0的非负μ-调和函数族记为_μH.对Ω~β_α的Kerekjato-Stoilow意义下的理想边界β的任一点ζ.该文通过定义_μH→_μH的线性算子π_ζ,引入_μH的子函数族H_ζ={u∈_μH|π_ζ(u)=0},证明了在Ω~β_α上关于ζ的μ-广义Picard原理成立,即_μH的维数是1或_μH/H_ζ的维数是1二者必居其中.

关键词　Schr　dinger方程,广义函纹,Sobolev空间,Picard原理

分类号

GENERALIZED PICARD PRINCIPLE FOR SCHR　DINGER EQUATIONS WITH NEGATIVE PLANAR POTENTIALS

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Abstract Let β be a compact set will null capacity in the disc Ω_α={z||z|<α} on the complex plane.Consider a stationary Schr〖AKo¨〗dinger equation (-Δ+μ)u=0,where the potential μ≤0 is a Radon measure of Kato Class on Ω~β_α=Ω_α\β.Denote by _μH the class of all functions u on Ω〖TX-〗~β_α with the following properties:u is nonnegative and continuous on Ω〖TX-〗~β_α;u vanishes on {z||z|=a};u is a distributional solution of the equation on Ω〖TX-〗~β_α.For an ideal boundary point ζ∈β of Ω~β_α in Kerekjato-Stoilow's sense,a linear operator π_ζ of _μH→_μH is defined,and a subclass H_ζ={u∈_μH|π_ζ(u)≡0} of _μH is introduced.It is proved that the μ-generalized Picard principle is valid for ζ on Ω~β_α,i.e.,one of the following statements is true:(i)_μH is of dimension 1,and (ii)_μH/H_ζ is of dimension 1.

Key words Distribution　Sobolev space　Brelot space　Generalized Picard principle

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