

活动星系核连续谱辐射

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摘 要

连续谱辐射是研究活动星系核结构主要手段之一。谱型、光变、偏振是表征连续谱性质的最主要内容。活动星系核的最主要特征是几乎覆盖了整个电磁波段、且有着大幅度 and 快速时标的光变。主要评述了活动星系核从射电到 γ 射线的全波段性质, 观测对活动星系核结构的物理限制及现存的物理模型和解释, 并指出了将来的课题。

关键词 辐射机制: 非热 γ 射线: 理论

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Intrinsic Constraints on Very High Energy Emission in Gamma-ray Loud Blazars

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Abstract

Photons with very high energy up to TeV (VHE) emitted from active galactic nuclei (AGNs) provide some invaluable information of the origin of γ -ray emission. Although 66 blazars have been detected by EGRET, only three low redshift X-ray selected BL Lacs (Mrk 421, Mrk 501, and 1ES 2344+514) are conclusive TeV emitters (PKS 2155-304 is a potential TeV emitter) since VHE photons may be absorbed by cosmological background infrared photons (external absorption). Based on the "mirror" effect of clouds in broad line region, we argue that there is an intrinsic mechanism for the deficiency of TeV emission in blazars. Employing the observable quantities we derive the pair production optical depths due to the interaction of VHE photons with the reflected synchrotron photons by electron Thomson scattering in broad line region. This sets a more strong constraints on very high energy emission, and provides a sensitive upper limit on the Doppler factor of the relativistic bulk motion. It has been suggested to distinguish the intrinsic absorption from the external by the observation on variation of the multiwavelegenth continuum.

Key words radiation mechanism: nonthermal—gamma rays: theory