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广义Tortoise坐标变换与动态Kerr-Newman-de sitter黑洞的热辐射

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A new tortoise coordination transformation and the thermal radiation of non-stationary Kerr-Newman-de sitter black hole

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摘要 根据广义乌龟坐标变换法(GTCT),对动态Kerr-Newman-de sitter黑洞的热辐射机制进行了研究.首先,利用在弯曲时空中描述自旋为0,质量为*m*的标量粒子的动力学方程(Klein-Gordon方程),再通过2种不同广义Tortoise坐标变换,最终得到了动态Kerr-Newman-de sitter黑洞在这2种不同情况下的热辐射谱,以及各自在事件视界处的霍金温度.通过对比研究发现,在2种不同Tortoise坐标变换下得出的热辐射谱,其形式是相同的,但是其值却是有所差异的.其根本原因在于所用的坐标变换不同导致了值存在一定的差别.同时,还分析了新广义Tortoise坐标在量纲上的合理性等问题.

关键词： 新Tortoise坐标变换 Kerr-Newman-de sitter黑洞 热辐射

Abstract： Based on the method of Tortoise coordination transformation(GTCT),the thermal radiation of Kerr-Newman-de sitter black hole is investigated.First,We make use of the Klein-Gordon function which depicted by the scalar particle,its mass is μ and spin is zero.Then,the thermal radiation spectrum of the dynamic Kerr-Newman-de sitter black hole is obtained in two different tortoise coordination transformations.Finally,we can attain the temperature at the event horizon.Also We find the form of the thermal radiation spectrum with two different tortoise coordination transformations are same,but the value of the thermal radiation spectrum are different.That different tortoise coordination transformations lead the value is different is the basic reason.Furthermore,we study the rationality and other related issues of the new tortoise coordination transformation.

Key words： new Tortoise coordination transformation Kerr-Newman-de sitter black hole thermal radiation

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