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Hawking-like radiation of charged particles via tunneling across the lightcylinder of a rotating magnetosphere. (English) Zbl 1483.85007
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Summary: In rotating magnetospheres planted on compact objects, there usually exist lightcylinders (LC), beyond which the rotation speed of the magnetic field lines exceeds the speed of light. The LC is a close analog to the horizon in gravity, and is a casual boundary for charged particles that are restricted to move along the magnetic field lines. In this work, it is proposed that there should be Hawking-like radiation of charged particles from the LC of a rotating magnetosphere from the point of view of tunneling by using the field sheet metric.

MSC:
85A15 Galactic and stellar structure
70E05 Motion of the gyroscope
83C30 Asymptotic procedures (radiation, news functions, H-spaces, etc.) in general relativity and gravitational theory
81U26 Tunneling in quantum theory

Full Text: DOI arXiv

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