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Generation of gravitational waves by a standing electromagnetic wave. (English)

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Summary: The process of generating gravitational waves by a standing electromagnetic wave is considered. The description of gravitational waves coupled with the electromagnetic field is carried out on the basis of linearized Einstein gravity. It is shown that such gravitational-electromagnetic waves inside a Fabry-Perrot resonator lead to generation of the usual high-frequency transverse-traceless gravitational waves which propagate in two mutually opposite directions in empty space outside the resonator. A comparison of gravitational waves coupled with the electromagnetic field and free waves in empty space is carried out.

MSC:

83C35 Gravitational waves
83C50 Electromagnetic fields in general relativity and gravitational theory
78A40 Waves and radiation in optics and electromagnetic theory

Full Text: DOI

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