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Electromagnetic radiation by gravitating bodies IWO BIALYNICKI-BIRULA, Center for Theoretical Physics, Warsaw, Poland, ZOFIA BIALYNICKA-BIRULA, Institute of Physics, Warsaw, Poland — Gravitational radiation is now a well understood and observationally confirmed phenomenon. Gravitating bodies in motion, however, regardless of their constitution, always produce also electromagnetic radiation in the form of photon pairs. This phenomenon is an analog of the electromagnetic radiation caused by the motion of dielectric (or magnetic) bodies. This electromagnetic mechanism has its source in the variation of the material coefficients with time. In curved space the components of the metric tensor play the role of the material coefficients. The gravitational particle production is due to changes of the metric with time. This effect has been considered mostly in the cosmological context. In contrast, we consider here only local perturbations of the metric avoiding the global cosmological issues. Production of photon pairs caused by changes of the medium with time is a purely quantum-mechanical effect. One may say that the motion of the medium squeezes the electromagnetic vacuum. Unfortunately, the emitted radiation is extremely weak as compared to radiation produced by other mechanisms.

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