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Surface Radiation from Charge Moving along Corrugated Metal Structure with Small Period

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We study a “longwave” radiation of a charge moving along a corrugated structure perpendicularly to its grooves. The wavelengths under consideration are assumed to be much more than the period and the depth of corrugations. The real surface is replaced with the plane on which equivalent boundary conditions are set. It is shown that relativistic charge can generate surface waves. The detailed analysis is performed for the case of ultra-relativistic charge. We obtain the field components and the spectral density of surface radiation. The results obtained are of interest for development of new methods of generation of microwave radiation.

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